

B. & M. "Flying Yankee" at Haverhill, Mass.

Railway Age

Vol. 83 October 22, 1927 No. 17

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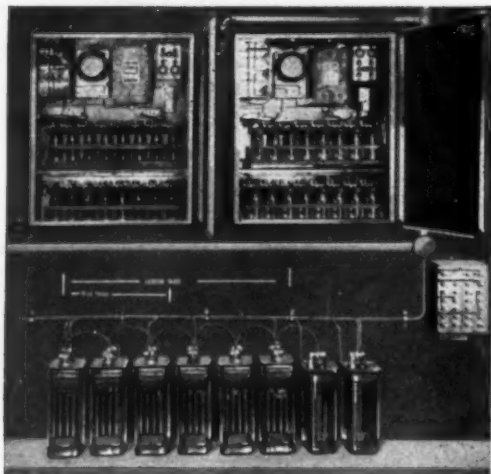
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Double Service at a Lower Cost

THE proposal of the Southern Pacific to take off two passenger trains and substitute four bus schedules on a portion of the San Francisco-Ogden line, reported in a recent issue of the Motor Transport Section of the *Railway Age*, is an instance of the way in which the railways are bettering their passenger service with respect to frequency at a cost less than that of providing the fewer schedules. The people living in the small towns along the Southern Pacific's Sacramento-Colfax line have had only two local trains in each direction daily, and there have been long periods during the day when no train service was available. The length of these no-service periods will be proportionately shortened by the operation of the motor buses on four round-trip schedules daily. The benefit to the public from this installation of bus service is obvious. While doubling its service, the Southern Pacific will at the same time be able to lower its cost substantially.

Safety and Length of Service

A STUDY made recently on a southwestern railway indicates conclusively that the majority of injuries are suffered by men who have been in the service long enough to know better. In the five years, from 1922 to 1926 inclusive, there were 399 personal injuries on this railway. The study shows that of this number 237 injuries, or more than 59 per cent, were suffered by employees with over five years' service, while employees with three to five years' service suffered 79 injuries, or more than 19 per cent. Seventy-eight per cent of the men injured had been in service three years or longer, a sufficient time in which to learn safety. The point is, however, that they had also been in service long enough to acquire sufficient confidence in themselves to be careless at the wrong time. Of course, in making these comparisons account should be taken of the fact that the number of employees with more than three years' service is greater, but not sufficiently so to create such a preponderance of injuries. The study indicates conclusively that confidence results in carelessness, and safety supervisors should take cognizance of this fact.

Yard Limit Rules

RULE 93 is couched in terms sufficiently inclusive so that operations within yard limits are left practically to the railways' discretion, provided adequate protection is furnished under the terms of Rule 99. The practices on different railways vary materially as to clearing the main track in yard limits for through trains. In some instances, the through trains are protected; in others, the yard engines are protected. On the railways where through trains are protected in their use of the main

track through yards, this has been found to speed the operations of through trains, while after a few weeks' operation under this system the yard crews arrange their work so that the through trains offer relatively little interference. Eventually, certain standards may be set in the way of safe operation through yards that will be adopted universally. In the meantime, one road, at least, has installed a unique system of speeding the movement of through trains through some of its yards. The yard limit in those yards where only one or two shifts are operated is made elastic. In other words, these places are considered as yards only during the time they are being operated as such. At other times of the day or night the yard ceases to exist, so far as the operation of through trains is concerned. If, by any chance, a yard engine should happen to move on the main track during the time the yard limits are not effective, it must protect itself thoroughly against the movement of trains the same as if it were out on the road where there were no yard limits. This practice has been found to save a great deal of time for the through trains and to offer no additional hazards, since yard operations are protected during the time yard engines are working.

State Motor Transport Regulation

SEVERAL decisions of state authorities on applications for bus operating permits give eloquent testimony as to the wisdom of regulation of interstate lines in some such measure as intrastate lines are now regulated. New Jersey offers several excellent examples. The last few miles of routes going from that state into New York City offer obstacles to the motor vehicle—highway congestion and the ferry trip across the Hudson. For this reason several operators conceived the idea of terminating their lines in Jersey City, allowing passengers to complete the trip more expeditiously on the Hudson tubes. This change of terminus, however, puts the highway carrier on an intrastate basis and authority to operate must be secured from the state commission. Several such applications have been made and, while some have been granted, others have been denied, which simply means that carriers are now operating on an interstate basis which would not be in business if the same measure of supervision were exercised over them as over intrastate lines. In Pennsylvania recently an interstate carrier which operated from Harrisburgh to Philadelphia via Camden, N. J., was ordered to desist, the extension of the route into New Jersey being held "a mere subterfuge or scheme to evade the law." As long as highway carriers are permitted to conduct themselves as interstate carriers in a manner in which state authorities would not permit in intrastate operation, uncertainty and confusion must remain in highway transportation. There will be uneconomic competition between

various bus lines and between bus lines on the one hand and other agencies of transportation on the other.

Traffic Department and Car Miles

EXPERIENCE shows that thirty miles per car per day is a reasonable car mileage for the railways to make every day, and that it should be exceeded when conditions are favorable. To increase miles per car per day the railways have been conducting educational campaigns among employees and eliminating time wastes in car movement wherever possible. It may safely be said that, so far as the operating department is concerned, most railways are doing everything possible to increase car miles. It should not be overlooked, however, that the traffic department may assist materially in this regard. Cars being held for diversion or reconsignment are a fruitful source of delays and it is in this regard that the co-operation of the traffic department should be solicited. Traffic representatives having jurisdiction over diversions and reconsignments should be impressed with the necessity of saving car-time. By placing the order for diversion or reconsignment promptly at the proper point, ahead of the time the car arrives, if possible, a great many car-days may be saved. In addition, this will result in operating economies, since it will, in many cases, obviate the necessity of switching the car into the "hold" track, and later switching it out again.

Britain's Non-Stop Runs

GREAT BRITAIN during the summer just past set up new records for non-stop passenger train service, having had no less than 10 such runs each day ranging upward from 199 miles. The longest, on the London & North Eastern from London to Newcastle-on-Tyne, was 268 miles. This run has been discontinued for the winter, but the London, Midland & Scottish, which operated a 236-mile non-stop run from London to Carnforth during the summer, is now running its "Royal Scot" non-stop between London and Carlisle, a distance of 299¼ miles. This run, however, the Railway Gazette (London) points out, is not the fastest on the long non-stop basis, the Great Western's "Cornish Riviera Express" still holding that record, covering the 226 miles from London to Plymouth at a scheduled speed of 56.5 m.p.h. One of the locomotives regularly assigned to this run, the "King George V," was on display at Baltimore & Ohio's centenary exposition, where no doubt many American railroad men saw it. Finally, it must be admitted that there is not necessarily much practical merit from an operating standpoint in these long distance non-stop runs. It might conceivably be somewhat more economical to stop once or twice, either for mechanical or traffic purposes. However, that in Great Britain this non-stop operation captivates the imagination of the public cannot be doubted by anyone who reads British newspapers. Any additional inconvenience or expense of such operation can thus be charged to the account of publicity or advertising, and it is probably a bargain. Whether greater attention to this specific step by the American railroads would attract the same degree of public attention, one may well doubt. Our public is different, our country is different, our railroads are different. Varying problems call for varying solutions. The important point in merchandising, however, is to arouse the interest and keep the attention of the public in as many ways as possible—and the spec-

tacular has its value in this field, even though it may not always conform exactly to a program of the highest efficiency in production. Transportation agencies have their selling problems just as do the manufacturers of other commodities—differing in degree but not in kind.

Helpful Books for Travelers

MANY people who travel for pleasure, or even on business, for that matter, like to read and study in advance about the country through which they will pass or which they expect to visit. A suggestion was made in the *Railway Age* of September 10 that passenger traffic departments by including a selected list of good books in their folders and pamphlets, might do much to stimulate an interest in travel and assist travelers in locating the books that might be of the greatest interest and help to them. A variety of titles should be included in such lists to suit people of different tastes. Some may desire historical works, while others will be interested in up-to-date information about the district, including its resources and other important features. Still others may prefer to gain their impressions from works of fiction, historical or modern. The great difficulty which now confronts the prospective traveler is to know where he can get information about such books. The suggestion was made in the above-mentioned editorial that railroad officers might secure help in compiling such lists from the local librarians along their lines. An even better suggestion is that the Library of the Bureau of Railway Economics at Washington is well equipped to assist the railroads in compiling lists of such books, either for use in connection with passenger traffic literature or as the basis for libraries on observation cars or at other places.

Casualties from Sudden Shocks

RAILROADING each year is becoming a less hazardous occupation, as the accident statistics issued by the Interstate Commerce Commission show. In 1925, the last full year for which detailed figures are available, 996 employees on duty lost their lives in train service accidents and 188 in train accidents. In 1920 these totals were 1,685 and 422 respectively. Injuries to employees on duty in train and train service accidents in the five-year period show a corresponding decrease. An examination of the detailed causes of death and injury, however, does not show in all classifications the same uniform decline in casualties.

Concentration of attention on classifications of accidents showing but small decrease is important if railroading is to be made a still safer occupation. One such classification is that of employees on duty killed and injured by sudden stopping and starting, a lurch or jerk of a train, or a sudden application of brakes. In 1920 a total of 33 employees were killed and 3,270 injured from these causes. In 1925, 31 were killed and 2,998 injured. The bulk of these accidents occur in freight service. In 1925 freight train miles were 6 per cent less than in 1920. Casualties from sudden shocks in the same period declined by about the same percentage as far as deaths are concerned, and injuries were reduced by 8 per cent. On the other hand, by way of comparison, total deaths to employees in train and train service accidents in the same period were reduced 50 per cent.

Apparently some study to determine why accidents in the "sudden shock" category show so few signs of diminution might be profitable. Reasons for this con-

dition, however, should be assigned only after scientific investigation and should not be based on mere conjecture. Some might believe that the increase in average cars per freight train from 35.6 to 46.3 in the same period had something to do with it. On the other hand the great improvement in average draft gear conditions, mentioned in an editorial in our issue of October 1, has undoubtedly gone far to mitigate any increase in the violence of shocks which might come by reason of greater train length. Some improvement undoubtedly could be effected by greater care on the part of engineers in the handling of the brakes and in starting. Trainmen ought to be impressed frequently with the dangers of sudden shocks and the necessity for constant care while on trains. Finally, casualties might be reduced by removing sharp edges and points and by watching safety factors more closely in caboose construction. Railroading is getting safer year by year, but constant attention is the only means of insuring improvement.

The Downward Drift of Freight Rates

HERE are four facts in the railroad history of the first eight months of 1927 which merit very serious consideration by railway officers, members of the Interstate Commerce Commission and the public: First, the efficiency with which the railways were operated during this period surpassed all previous records. Second, the number of tons of freight carried one mile was slightly larger than in the corresponding two-thirds of any previous year. Third, freight earnings were smaller than in the first two thirds of 1926, or even of 1923. Fourth, although the number of tons of freight carried one mile exceeded all previous records, the net operating income earned was \$70,000,000 less than in the first two-thirds of 1926.

The decline of net operating income was due to a combination of causes, including a decline of passenger business and advances of wages. Probably, however, the facts which most need to be bracketed together for attention are that, with actually a small increase of freight business during the period, there was a decline of freight earnings. The reason was, of course, that the average revenue received per ton-mile declined. The last general advance of freight rates was made in 1920. The last general reduction was made in 1922. Many assume that since then freight rates have been practically stationary. This is far from true. Average revenue per ton-mile is subject to fluctuations caused especially by changes in the relative amounts of high-grade and low-grade traffic handled, but it has proved over long periods to be a reliable measure of the general level of freight rates. Complete traffic statistics are available only for the first seven months of 1927. In the first seven months of 1920, before the large general advance in rates was made, average revenue per ton-mile was 9.70 mills. In the first seven months of 1921, when the advanced rates were in full effect, it was 1.264, an increase of 30 per cent. In the first seven months of 1924, after general reductions had been made and when no abnormal traffic conditions existed, it was 1.124 cents, and in the first seven months of subsequent years it has been as follows: 1925, 1.102; 1926, 1.089; 1927, 1.073.

Effect on Earnings

On superficial consideration it might be said the decline this year has been due partly to the effect of the coal strike on the traffic. But this is not true, because during the entire first seven months of the year ship-

ments of coal were as large as in the corresponding part of 1926. The decline in average revenue per ton per mile that has been occurring undoubtedly has been due, not to changes in the character of traffic, but to reductions of rates. The reductions may seem small, but they have had important effects on railway earnings. If in the first seven months of this year the railways had received the same average revenue per ton per mile as they did in the corresponding part of 1924 their freight earnings would have been \$164,000,000 larger than they were. If they had received the same average revenue per ton per mile as in the corresponding part of 1925 their freight earnings would have been \$61,000,000 larger than they were. If they had received the same average revenue per ton per mile as in the first seven months of 1926 their freight earnings would have been \$39,000,000 larger than they were, and apparently their loss of freight earnings in the entire year 1927, owing to reductions of rates within the last year, will be about \$65,000,000.

The cumulative effect of all the reductions of freight rates made since 1921 is enormous. As already stated, the increase in average revenue per ton per mile due to the advance in rates made in 1920 was about 30 per cent. As a result of all the reductions that have since been made average revenue per ton per mile is now only about 9.5 per cent more than it was when the railways were returned to private operation in 1920 and before the advances of that year were made. Therefore, more than two-thirds of the general advance made in 1920 has now been wiped out. If the trends of traffic and rates are approximately the same throughout 1927 as they were during the first two-thirds of it, the total reduction of freight rates since 1921, on the basis of 1927 traffic, will amount to about \$924,000,000 annually.

"Readjustments" Usually Downward

The steady decline of rates that has been occurring has been due to steps taken by both the railways and the Interstate Commerce Commission. The railways are under constant pressure to make "readjustments" to remedy alleged discriminations or to enable shippers on their lines to enlarge old or reach new markets. They find it extremely difficult to remedy a supposed discrimination by advancing a rate or rates. Almost always any readjustment that they make is affected by a reduction. Likewise, and with much more effect upon the average revenue per ton per mile, the Interstate Commerce Commission is constantly making downward readjustments. Such decisions of the commission as those in the deciduous fruit case and the coal rate cases attract much attention, and if they indicate the policy that will be followed by it in future are of great importance. But of only less importance in their effect upon railway earnings are the constant downward readjustments of rates reflected in the steady decline of average revenue per ton per mile even when no rate reductions are being ordered that attract much attention.

It is an old story that only in one year of the more than seven years the Transportation Act has been in effect have the railways as a whole earned what the commission has held to be a fair return. When is adequate consideration going to be given by railway officers and members of the Interstate Commerce Commission to the effects that have been and still are being pronounced by the steady decline of rates, and to the more important effects that will be produced in future if it continues? There is a wide difference between a decline of commodity prices and a decline of freight rates. A decline of commodity prices may be and usually is followed by an increase of them in response to the operation of the law of supply and demand. On the other hand, a decline of

freight rates under our policy of regulation never has been and apparently never will be followed by an advance in them without a struggle in which the shippers and the railways are arrayed against each other. If the railways try to make general advances they are usually confronted with the combined opposition of the shipping interests and told that general advances are economically unsound. If they try to advance rates upon particular kinds of commodities produced by large industries, the big shippers are likely to use effectively the big stick of competition, and the Interstate Commerce Commission is indisposed to take the initiative in indicating any commodities on which it may believe rates ought to be advanced.

History Repeating Itself

This downward trend of freight rates prevailed before the war almost regardless of all conditions and tendencies in general business. Every railway officer and business man knows the effects finally produced on the net return of the railways, their credit, their development and their ability to render satisfactory service. It was the transportation conditions to which it led that precipitated the adoption of government control and led later to the passage of the Transportation Act with the plain purpose of preventing a recurrence of the pre-war developments. Nevertheless, history is being allowed to repeat itself. Although the stock market under present abnormal financial conditions gives it little heed, there is great significance in the eight-month's record alluded to showing the handling of a record-breaking freight business accompanied by a large reduction of net operating income. How long will history be allowed to continue to repeat itself? When will railway officers, members of the Interstate Commerce Commission and the shipping public recognize the plain fact that the downward trend of freight rates is fraught with danger, as it was before the war, to railway credit, railway development and railway service?

The Past and Future Progress

BUSINESS development in America is becoming a matter for expression in terms of cold economic facts in which the test of all values has gradually become their reducibility to terms of dollars and cents. There are, unfortunately, a number of values which cannot be stated in such terms. One of these is romance—the element of the spectacular in the human accomplishments which underlie the development and growth of our present material civilization. Probably nowhere is this element of romance more strongly marked than in railway transportation and a striking demonstration of its appeal has just been afforded by the wide-spread public interest in the “Fair of the Iron Horse”—the Baltimore & Ohio Centenary exhibition and pageant.

The numerous comments of appreciation and commendation from those who were fortunate enough to have inspected the exhibits and witnessed the pageant have frequently included expressions of a hope that some way might be found to keep the collection of striking and historically valuable exhibits intact in a national transportation museum. These are no more the expressions of railroad men than they are of laymen who have felt a strong stirring of pride in their railway transportation system as a national accomplishment. Two letters expressing this hope will be found in the communications column of this issue. Another has already appeared in the issue of October 8.

The establishment of a permanent transportation museum is highly desirable. If the development of our

railway transportation system is something in which as a nation we may take pride, is it not a matter of some moment that every possible tangible evidence of the steps in this development, to some of which the pride stirring romance still clings, be preserved? At the outset, no doubt such a museum would contain a minimum of material of future technical value, being made up largely of those exhibits possessing the greatest popular appeal. Is it not probable, however, that a national repository, once established, would gradually become the recipient of collections of historical material covering many important technical developments, now retained in widely scattered private hands, which would be of no small value and interest to those intimately associated with future progress?

The collection assembled by the Baltimore & Ohio as a part of its centenary celebration is an imposing beginning for a national museum. Its future development, however, must be along broader lines than it would be either practicable or desirable for a single railroad to undertake. No more appropriate sponsor for such a museum could be found, however, than all the railroads, acting together, and the establishment and maintenance of such an institution by the American Railway Association would seem to meet all the requirements for a broad national character.

The ultimate location and scope of such an undertaking is a matter which cannot be settled without considerable study. As an immediate and perhaps temporary solution of this problem, however, the present location and buildings at Halethorpe offer the advantages of availability, assuming that a mutually satisfactory arrangement could be made for their utilization pending the decision as to a permanent location.

Assuming that such an arrangement could be effected, there is a further use to which the plant at Halethorpe could well be devoted which would be of even more immediate value to the railroads than the retention of the nucleus of a splendid museum collection.

The suggestion that the American Railway Association undertake the development of a research organization has frequently been made and at various times has received the serious consideration of that organization. While no general research policy has been established by the association, it has already undertaken comprehensive investigations of air brakes and draft gears. There are many problems, the basic data for the solution of which can best be developed by a general sharing of the burden through the American Railway Association because the benefits to be derived are general. An article discussing freight car derailments, elsewhere in this issue, sets forth an imposing list of needed basic information pertaining to the prevention of derailments and to the relation of car wheel loads to track stresses which would undoubtedly be of great value in directing future development in car truck design along sound lines.

Whether or not it would prove ultimately desirable for the American Railway Association to undertake a continuous program of research with permanently established laboratory facilities of its own, the present track layout at Halethorpe is believed to be adequate for the investigation of at least a part of the fundamental considerations just referred to and might well be utilized for such an investigation. Should it ultimately seem desirable for the Association to undertake a continuous program of investigations, the location of permanent laboratory facilities for the development of sound progress is not at all inappropriate for consideration in connection with a permanent museum recording the accomplishments of the past. Indeed the public interest which the latter will give to the former consideration will, in itself, be of no small value to the industry.

Some of the Fundamental Principles of Air Rights*

A study of the opportunities and limitations of these assets in the development of railway terminal property

By Joshua D'Esposito
Consulting Engineer, Chicago†

THE development following the building of the New York Central's passenger terminal in New York, consisting of a splendid group of monumental buildings and miles of beautiful streets—a development both spectacular and of great economic importance—has introduced in our system of railroad economics the conception of a new value of railroad property; namely, that of air rights over railroad tracks and facilities. The fact that in reality there is nothing new in the exploitation of air rights does not change the situation. The New York undertaking had sufficient dramatic value to be considered the beginning of a new period in the utilization of railroad properties.

It is immaterial at this time to analyze the nature and to investigate the reason for the phenomenal success of the New York Central undertaking; whether or not every advantage was taken of the physical conditions of the location and of the site; whether or not it was all foreseen or it came about by fortuitous circumstances. Nothing matters now in the face of a gigantic accomplishment boldly carried out. However, some of the important facts related to this one undertaking are of general interest. In the first place the great area involved, from 42nd street to 52nd street, comprises approximately 2,000,000 sq. ft. or 45 acres, of which the station building proper occupies no more than 325,000 sq. ft. The streets occupy almost 30 per cent of the whole area, or 680,000 sq. ft., while the areas utilized for building approximate one million square feet. In the second place, it is observed that the principal and most outstanding structures in the group are some of the largest and most pretentious apartment buildings in the city, rubbing elbows with office buildings, hotels, an exhibition building and other heterogeneous structures—and in spite of all the whole group is more harmonious and better balanced than any other group of buildings in any other American city.

An achievement of such magnitude, of very great financial importance to the railroad involved, and of such great benefit to the city as well, could not fail to stir the imagination of men as to the great value of air rights, the possibilities of transforming our cities by creating beautiful streets and parkways and by eliminating noisy and objectionable railroad operating activities. As a consequence, the utilization of air rights has entered as a major factor in the study of all terminal problems in our large cities.

That this is so is indicated by an analysis of the terminal schemes developed for Cleveland, Philadelphia



The Grand Central Development, New York—Photo by Ewing Galloway

and Chicago, in all of which the utilization of air rights has been or will be carried out to an extent undreamed of 15 or 20 years ago. In both Cleveland and Philadelphia the railroad facilities are designed and coordinated with the commercial buildings to be erected over the railroad facilities and every effort is made to bring about the maximum possible use of all the available property. In the case of the Philadelphia station of the Pennsylvania, it is hoped that the development of the air rights will in time be sufficient to absorb the cost of the entire improvement, and while this is an optimistic point of view, nevertheless it is a reasonable one in view of the experience in New York.

Air Right Development Not New

As now generally understood, the term air rights is taken to mean the space above a plane of clearance over railroad tracks and facilities, capable of utilization for the construction of streets and buildings in the same manner as if the railroad facilities did not exist. From an historical standpoint, there is nothing new in this conception for as far back as 1863 the Pennsylvania made full use of air rights in the construction of the Panhandle tunnel in the city of Pittsburgh. This tunnel under Granite Hill, in the very heart of the city, 1,325 ft. long and for double track, was built as an open cut for most of its length, then backfilled and later on all the properties above it were sold as unincumbered real estate, the railroad retaining an easement covering the periphery of the tunnel structure. As a result of this transaction, the city extended over the tunnel without interruption, and buildings and streets now go over as if no railroad was there—a perfect utilization of air rights over railroad tracks. That the transaction was also profitable to the railroad at that time there cannot be any doubt; the cost of construction was unquestionably reduced and a considerable

* A paper presented before the Western Society of Engineers, Chicago, on October 10.

† Formerly chief engineer, Chicago Union Station.

revenue accrued from the sale of the land over the tunnel. Whether or not this particular undertaking has been an unmixed blessing is another story.

A later example of air right development antedating the New York undertaking, is the Back Bay station of the New York, New Haven & Hartford in Boston, Mass. In this instance a large station building is placed directly above the tracks and platforms, the entire terminal being confined within the limits of the railroad right-of-way. This arrangement was chosen by reason of the high cost of the real estate which would have been required for a station layout, and without doubt was an economical solution of a difficult problem.

An outstanding characteristic of this layout is the provision made in the structure for ventilating the track space by the use of openings in the ceiling above the tracks, such openings leading to stacks extending to the top of the building. As far as I can find out, this is the first attempt made to dispose of smoke and gases under the conditions which are inevitable with steam operation. These two examples have been cited out of a large number of instances where the railroads, generally for their own needs and for reasons of economy, have made use of what we now call air rights, long before air rights became the consideration that they are today. It must be admitted, however, that all of the early developments were incidental, and, we may say, accidental; there was not a general purpose behind the idea; there lacked the fundamental conception that a more intensive use of costly railroad properties should be made wherever conditions permitted, and where no undue restriction would be imposed on railroad operations.

Steam Operation a Handicap

With a railroad operating by steam power, the limitation on the requirements of railroad operation made the utilization of air rights almost an impossibility, and it was not until electric operation came into effect that it became possible to attack the problem with comparative freedom. It is true that in the case of the Back Bay station in Boston, it was found possible to operate a station over a steam railroad, but it is also true that the results obtained here are not entirely satisfactory, and they would be even less so in the case of a very extensive layout covering the large area. Without a doubt, with our better knowledge of ventilating problems, and in the light of recent investigations, a much more satisfactory solution could be developed today than was possible 30 or even 20 years ago; but nevertheless, it can be considered axiomatic that electrification of the railroad involved is a fact which must precede the full use of railroad air rights. While electrification is imperative in order to make full use of air rights, it does not follow that partial use of air rights cannot be made even with steam operation; as a matter of fact such partial use of air rights, to an extent unsuspected by those unacquainted with the facts, has already been made in the development of the Chicago Union station project. The railway mail building, the Pennsylvania freight terminal, the Burlington freight terminal, the C. & A. freight terminal, the station headhouse itself and the Chicago Daily News building now under construction, are all in the nature of air right developments over railroads not electrified, and, taken all together, make up not less than 25 per cent of the total area occupied by the entire terminal layout. In other words, taking the entire area from Twelfth street to Fulton street, and from Canal street to the river, including the block occupied by the headhouse west of Canal street, we find that out of a total of approximately 4,000,000

sq. ft., one-fourth has already been utilized in developing air rights, one-eighth or 500,000 sq. ft., is used for streets and viaducts, and the remainder, 2,500,000 sq. ft., is occupied solely by railroad facilities.

With the exception of the Daily News building, no special provisions have been made in any case for exhausting smoke and gases, and while the results have not been as satisfactory as one would like to have, nevertheless, the buildings are used as intended, and the railroads are operated safely and normally. In the case of the Daily News building a very extensive and elaborate ventilating installation is being provided, for the reason that the building will be directly over station tracks and platforms. This installation will be similar in principle to the one adopted in the case of the Jackson Boulevard viaduct, which has now been in service several years, and demonstrated its ability to meet the most difficult situations. Furthermore, the conditions governing the space requirements of this particular structure are such as to make possible the installation of exceptionally large smoke chambers immediately over the tracks, a condition that would not obtain in all cases, all of which makes this development typical rather than general.

It goes without saying that the problem of adapting modern, complex, heavy structures of a public or private nature, above a complicated and generally quite inflexible track or terminal layout taxes the resourcefulness and the ingenuity of engineers. In the first place there are always limitations as to column spacing and column sizes; there are the problems of foundation design, of the arrangements for the installation of mechanical plants which ordinarily would be placed in the basement or sub-basement,—of connections to streets and viaducts so as to take care of expansion and contraction, of waterproofing at connections between streets and buildings, of vibrations set up by moving trains; and last but not least in most cases, the added burden of having to carry on difficult building operations over live tracks, generally at very congested terminal points. Only those who have had to meet and solve some of these problems can appreciate the amount of time, patience and ingenuity—mostly patience—that is required to bring into being one of these undertakings; but the complexities are in the very nature of the subject, and cannot be avoided. In dealing with all the various phases of the problem, it is important to keep in mind one cardinal principle, viz: that the railroad needs are always paramount, and the air rights incidentals. After all, the principal duty of a railroad is to manufacture and sell transportation, and every other activity should be subordinated to this primary requirement.

When Is Air Rights Development Justified?

When is the use of air rights economically sound and desirable? It is self-evident that no one would be interested in building over a railroad if the cost of creating the ground over such a road was greater than the cost of the free and unincumbered real estate adjoining. In addition to that, the loss of basement space and the additional cost of providing a substitute space, plus the additional cost of construction must be taken into consideration. We assume that it will cost not less than \$10 per sq. ft. to provide a ground level in lieu of that occupied by a free building, and that the basement will be worth not less than \$1 per sq. ft. per year rental, which is approximately equivalent to \$10 of capital investment, making a total cost of \$20 per sq. ft. to start with. Incidental disadvantages are probably worth as much as \$5 per sq. ft. more, making a total burden

of about \$25 per sq. ft. against air right use in favor of unincumbered land. This means, in other words, that railroad occupation imposes a burden on the land occupied by it of not less than \$25 per sq. ft., and therefore where land can be had at about this price, air rights are not commercially usable. This value is not a constant for all conditions, as in many cases a particular piece of land may have a peculiar value, due to its location, for some one definite purpose, but in general, actual practice confirms the conclusions above stated. It follows from the above that in any scheme of apportioning the value of land between the railroad and the air occupation, the railroad share is nearly a constant, it being a function of the burden imposed by the latter and not a function of the value of land. The division of 50 per cent for railroad uses and 50 per cent for air rights has been used in some cases; in others, one-third for railroad and two-thirds for air rights. Either division may or may not be the correct one.—At any rate, it is not possible to apply the same ratio logically for all conditions.

Ready for Development

Air rights, however, possess one general characteristic which enhances their values for commercial purposes—viz: their large areas and the fact that they constitute assembled property, ready for development. One of the most difficult commercial operations is the assembling under one ownership of any number of separate but contiguous parcels of land so as to form a plot of sufficient size to justify a modern, extensive development, and it is for this reason that property already assembled possesses a greater value than that in small parcels.

Railroad ownership is usually quite extensive, and it is generally the case that the railroads have at their disposal areas of air rights of much greater extent and much more desirable than any unincumbered land in the neighborhood. This fact alone, in my opinion, more than counterbalances the drawback of railroad operation underneath the structure, and is apt to be the outstanding factor in the exploitation of air rights in most cases. A confirmation of this statement can be found in the case of several exceptionally large and pretentious structures along Park avenue, in New York, where it has been possible to erect buildings occupying areas that it would have been utterly impossible to assemble outside of railroad ownership. It can be stated therefore that wherever air rights are available and a railroad is operated without smoke or obnoxious gases, air right development is better able to meet the needs of commercial requirements and furthermore that the utilization of air rights permits a more orderly development of streets and buildings than would be possible outside the limits of railroad ownership.

Limitations and Dangers

As already stated, in dealing with the problem of the proper and advisable utilization of air rights, the first consideration should always be given to the fundamental fact that a railroad exists primarily for the manufacture and sale of transportation for men and materials, and that anything that is done which could interfere with the primary activity must first be considered for its effect on that one basic requirement. Accordingly it is proper that we should consider to what extent the enclosing of our railroad plant within a solid and rigid shell impairs the capacity of this plant to perform its function. In my opinion the limitation of clearances, the features of ventilation, the lack of day-

light and some minor operating difficulties are of no serious importance; in fact there are some decided advantages in covering tracks and other facilities so that they are at all times free from snow, ice and from changes of temperature. On the other hand, there is the inevitable fact of the permanency of the thing after it is done—the fixing of things in such a way as to make it almost impossible to change them in order to meet new conditions, and this is a serious matter.

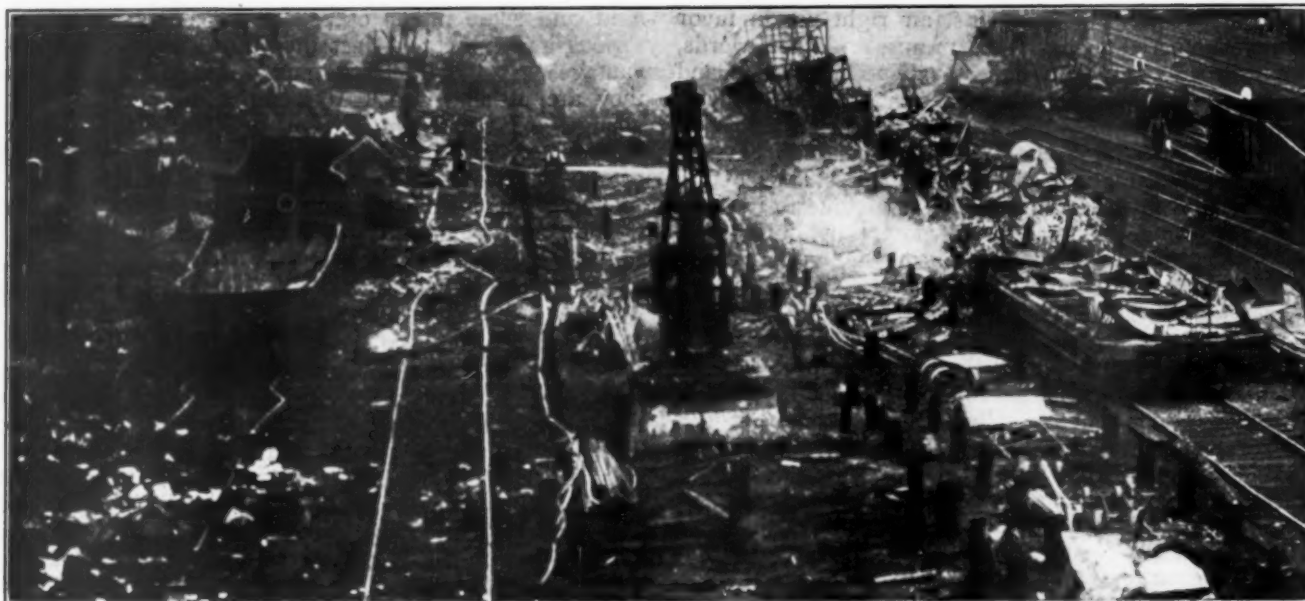
It may be said that air right use does not confine railroad facilities to any greater extent than any other limitation by private ownership, which is true only in part. While no impassable barrier is set up, there is nevertheless an additional obstacle in the way of changes and one that is apt to be very costly to eliminate if the need should ever arise. In this connection we may revert to the case of the Pittsburgh tunnel of the Pennsylvania. This tunnel, built at a time when tracks were laid on 12 ft. centers, and when equipment was much smaller than it is today, is now and has been for years inadequate for the requirements of modern operation. Innumerable schemes have been considered to improve the situation, but anything done now would be a major operation, and in the meantime the restrictions remain unchanged.

I have had the sad duty of having to tear down the work of men who had built with pride and confidence under the impression and in the belief that they were building for the ages—and it was easy enough to tear it down; but it will be much more difficult after the railroads have been enclosed between horizontal as well as vertical walls. A civilization must be adaptable in order to grow, and the physical things that go to make up the elements of civilization must be such as to permit changes without too laborious efforts. Sometimes, in the light of my own short experience, I permit myself to think that perhaps we are creating too many inflexible things for future generations to cope with.

Conclusion

Summarizing, the following conclusions can be maintained:

- (a) Except for peculiar and limited uses, air rights over railroads cannot be utilized unless the smoke and gases are eliminated by electrification or otherwise.
- (b) The utilization of air rights creates difficult engineering problems, but not beyond the ordinary good practice of capable designers, and their solution does not involve the use of prohibitive construction methods.
- (c) The operating conditions on the railroads affected are not unduly burdensome as a result of air right uses and in fact are in many respects improved.
- (d) From a user's standpoint, air rights offer greater possibilities for development than adjoining land under separate ownership.
- (e) The development of air rights offer possibilities of creating orderly and adequate civic improvements.
- (f) Air rights are not economically usable unless adjoining land has a greater value than at least \$25 per sq. ft.
- (g) There cannot be a fixed ratio between the value of the level occupied by the railroad and that of the air right, the former being almost a constant, the latter a variable for all locations.
- (h) There is great danger in developing air rights from the fact of fixing rigid and inelastic limits which impair the adaptability of the railroads to meet changing requirements of users and service.



Fire Damages Cars in Yards

Fire Losses Decrease in 1926

Railway Fire Protection Association plans further reduction at annual meeting in Detroit

EACH fire occurring in railroad hotels and eating houses cost Class I carriers an average of \$18,050 in 1926, while those caused by fuel oil systems resulted in an average loss of \$10,312, according to statistics presented at the fourteenth annual meeting of the Railway Fire Protection Association at the Statler hotel, Detroit, Mich., on October 11 to 13. The meeting, which was attended by 125 representatives of the railroads, was presided over by President G. S. Giles, fire prevention engineer of the Union Pacific, who commended the members on the success of their efforts which have reduced losses from fire to the lowest point reached during the past seven years.

The officers elected for the ensuing year are: President, W. H. Klinsick, engineer of fire insurance, Chicago, Burlington & Quincy, Chicago; vice-president, F. R. Bradford, supervisor of fire prevention, Boston & Maine, Boston, Mass., and secretary-treasurer, R. R. Hackett, chief inspector, Baltimore & Ohio, Baltimore, Md.

R.F.P.A. Invited to Join N.F.P.A.

The president, in his opening remarks, reported that the National Fire Protection Association has extended an invitation to the railway association to become a section of that body and urged the members to consider the proposition carefully before any definite action is taken. He also mentioned the desirability of establishing standing committees.

"While fire prevention work may not show a direct financial return in the annual report," he said, "nevertheless, the association, the underwriters and the alive and up-to-date railroad managements who are thoroughly sold on this important work know that this is a fundamental work, a public service work and a task which, in the conservation of invested capital and, fre-

quently, in the preservation of human life, will ultimately more than justify its necessary financial outlays." As evidence of the progress of the work of the association, he showed that the 1926 record of all fire losses in this country was the highest ever recorded, being over \$560,000,000, while of this total the rail roads were responsible for only \$7,268,435.

Early Railroad Mistakes Due to Lack of Specialists

R. H. Aishton, president of the American Railway Association, said that many of the mistakes of earlier railroading were attributed to a lack of specialized knowledge, resulting from a failure to exchange views and experiences on the part of the officers of various roads or several portions of the same road and that this lack of co-ordinated and standardized practices and policies is overcome in the focusing of special training upon individual problems of management.

"Undoubtedly," he continued, "the efforts of the Railway Fire Protection Association have materially assisted in bringing about the efficient operating conditions of the past several years. There is nothing that is so disruptive of railroad service as a disastrous fire. A wreck may be cleared away and operation will proceed as usual but a fire leaves its marks for days or even for months, crippling operating facilities and slowing up operations in every department which it touches. Hence it is that the gratitude of the executives of every railroad must be bestowed upon the members of the association for their efforts towards preventing this red scourge and cutting down not only the actual tangible money loss which accompanies a fire, but also that intangible, but none the less real, loss brought about through delayed and hampered operation as the result of a fire."

In the open discussion of field practice on fire pro-

tection and prevention, directed by Mr. Klinsick, several subjects were considered. Fires occurring during the spraying of proxylin lacquers, according to opinions expressed, occur only when the users do not adhere to the practices recommended by the manufacturers, especially those for proper ventilation. The latter requirements include the use of a spray booth, where possible, and a ventilating system so arranged that the air will circulate from the top of the building to the floor and thereby dilute the inflammable vapors collecting at the lower levels. Tests made to reveal the effects of hot metals on the ignition of the vapors of volatile oils and alcohols showed that copper caused them to burn at lower temperatures than any other metal, with the exception of the precious metals. It was also shown that the oils and alcohols having a low flash point have a high vapor ignition point while those with a high flash point have a low vapor ignition point.

The use of acetylene residue for whitewashing was approved only when the reaction of calcium carbide and water to form acetylene is complete and thereby removes the dangers of the combustion of any gas that might be generated when used as a whitewash. The residue from acetylene plants which drop the calcium carbide into the water were thought to more nearly complete the chemical reaction than those in which the water is dropped on the calcium carbide. To remove the possibility of any incomplete reaction, it was recommended that the residue be spread in a thin layer outdoors and thoroughly soaked with water.

Several roads experienced accidents from the substitution of gasoline in kerosene or other light oil signal lamps by employees, particularly switchmen, who believe that gasoline makes a prettier flame. This practice has been noticed since the adoption of a lamp which holds its fuel in a well filled with an absorbent material. Fires in lockers also have resulted from this practice, as that is where the employee stores his reserve supply of gasoline.

The use of 1½ in. hose for fire apparatus located within a building was approved, but it was felt that when the practice was employed particular attention should be given to the size and contents of the building. Several roads used a 2 in. hose at the hydrant and siamese this into two 1½ in. hose. The use of the 1½ in. hose, it was felt, enable one man to manage the apparatus and thereby extinguish fires before they had reached large proportions. This is often impossible with larger hose as two men are required to hold the nozzle because of the velocity of the water.

Considerable discussion was given to fires in coaling stations, which last year totaled 76 with a loss of \$165,701 or an average of \$2,180, and covered the construction of the chutes and the installation of sprinklers. It was recommended that in the construction of the hoppers care be exercised to eliminate the possibility of pockets occurring where fine coal might lodge and take fire spontaneously. The movement of the coal can be facilitated by lining the hopper with sheet metal. One road, which experienced several fires in a single hopper, 1,800-ton capacity coaling station, prevented a recurrence by changing to two hoppers, increasing the angle of the sides from 38 deg. to 57 deg. and lining them with sheet metal.

Loss from Fire Decreases in 1926

A total of 8,388 fires on 94 Class I roads in 1926, as compared with 7,866 on 85 Class I roads in 1925, with losses amounting to \$7,268,435 and \$7,397,433 respectively, were reported by the committee on statistics.

Although this is an increase of 522 fires, the damage was \$131,998 less. Figures for the year 1920 to 1926 show a decided improvement in the prevention of fires. During this period the number of roads reporting increased from 75 to 94 and the mileage reporting jumped from 194,166 to 253,278. At the same time the number of fires increased from 7,975 to a maximum of 9,210 in 1922 and then decreased to a minimum of 7,866 in 1925. The greatest loss occurred in 1920 when the amount was \$10,563,914 and the smallest in 1926 when it was \$7,268,435. The average loss per fire and the average loss per mile also fluctuated, the largest being \$1,324 per fire or \$54 per mile in 1920 and the smallest \$866 per fire or \$28 per mile in 1926. Carried further, the report shows that the average loss per road decreased from \$140,852 in 1920 to \$77,323 in 1926, the average loss per day from \$28,492 to \$19,913 and the average loss per minute from \$20 to \$13.

Origin Unknown

In 1926, the origin of the largest number of fires, 1,237, with losses totaling \$1,743,253, was classified as unknown. This was a decrease of 163 fires or \$519,210 under 1925. The next largest number, 1,018, with a loss of \$506,394, originated from heating appliances and flues. This is an increase of 137 fires or \$65,080 over 1925. The third largest number, 899, with a loss of \$794,752, originated on adjacent properties and spread to railway properties. This is an increase of 189 in the number, but a decrease of \$305,494 in the amount.

The most expensive fire was that originating from fuel oil systems which cost \$10,312 per fire, a total of 29 of these occurring in 1926 with a loss of \$299,056. The next were those due to wrecks where the average was \$7,029 for a total of 130 fires amounting to \$913,887. The third, omitting unknown and miscellaneous, were those originating from gasoline, oil, etc., the average for 76 fires with a loss of \$95,947, being \$1,262.

Rolling stock was the fuel for the largest number of fires, the number being 3,910 and the loss \$2,196,185. Cotton spark liability, which includes cotton burned while not under a bill of lading, was next with 1,350 fires and a loss of \$48,293 and passenger and freight stations and contents were third with 613 fires and a loss of \$488,024.

Fires in hotels, eating houses and contents were the most expensive, 70 fires aggregating \$1,263,547 and costing \$18,050 each. Cotton lading liability, or cotton already under a bill of lading, was next with 57 fires and a \$295,781 loss amounting to \$5,189 each. Merchandise in transit was third with 138 fires, a \$566,818 loss and an average of \$4,077. Miscellaneous materials totaled 11 fires, a \$455,790 loss or an average of \$41,435.

Gasoline Vapors Cause Many Fires

The committee on motor transportation reported that gasoline vapor causes many and may be responsible for spreading almost every fire that occurs in an automobile. To guard against this hazard, it recommended that tanks be constructed substantially, that they be accessibly located so as to permit inspection, that fuel filling openings be located so as not to be subject to mechanical injury, and that they be protected with an approved device that will prevent flames from entering the tank in the event of gasoline vapor becoming ignited when the filler cap is off. It also urged that care be taken to see that no lacquer, varnish or similar substance is left at the tank opening which might insulate the

filler hose nozzle from the tank and result in a static spark that would ignite gasoline vapor. The fuel line should be rigid throughout and located, supported and guarded to insure against vibration on other mechanical injury. The soft copper tubing generally used is inadequate for this service as it has a tendency to crystallize and harden and in this condition breaks readily. In discussing backfiring through the carburetor, the committee said the danger of fires following a backfire is greater if the engine is dirty or if it has been firing improperly and allowing the gasoline vapor to collect under the hood or in the engine compartment.

Recommendations for mufflers, exhaust lines, electric wiring and heaters, or automobiles and rail motor cars also were made. Various fire fighting equipment was recommended for ordinary fires, electric fires and gasoline and oil fires. That for the first included pump tanks, soda acid, foam and carbon dioxide extinguishers; that for the second, carbon tetra-chloride, and carbon dioxide extinguishers; and that for the third, foam, carbon tetra-chloride and carbon dioxide extinguishers.

The requirements suggested for garages and repair shops covered the construction, the light and power supply, ventilation, the battery charging plant, the operation and maintenance of garages, and the storage and handling of gasoline and oil.

Store Houses Large Risks

The statistics of the Railway Fire Protection Association for the last three years include 263 fires in storehouses resulting in a total loss of \$1,382,108 or an average of \$5,255 per fire, according to the committee on the protection of materials in storehouses. The losses in one of these years totalled \$867,247. These figures include many cases of slight damage, but the serious fires attest to the need for definite attention to preventive and protective measures in all such properties.

The values of the supplies and materials at single locations, exclusive of buildings, often run into the millions of dollars. The losses to this material caused by fire beyond any insurance recovery, represented in the necessity of immediately replenishing stock, making emergency purchases and shipments, and in the general inconvenience and delay, not only in storehouses but in the shops, should not be overlooked.

On many roads, separate departments for handling materials and supplies have been established only within a comparatively few years. As the value of specialized supply work has become apparent, housing has gradually improved, but there still remains much to be desired at many places.

Officers of this department have not always realized their responsibility and have not all taken the same interest in the prevention of loss by fire as they have in the prevention of loss by theft and waste. The reduction of fire losses in storehouses and material yards will to a large extent be dependent on the attitude of the officer in charge and that attitude will be generally reflected through the entire organization.

Special Storage Buildings

The prudent stores officer will call freely on the fire protection service of the property for the knowledge which only their experience with the subject can give. In considering new layouts or extensive alterations, it is particularly important that the fire protection department assist in the preparation of plans. The development of fire prevention as a habit among stores forces can be secured only by consistent personal example on the part of the man in charge.

The use of old car bodies, sheds and other readily combustible structures as special storage facilities is poor economy and should be avoided wherever possible. Metal buildings are coming into common use but must not be regarded as fire resistive, for they collapse readily when subjected to much heat and their ruin might prevent hose streams from reaching the burning material underneath so that both building and contents will be a total loss.

The selection and distribution of appliances for first aid in case of fire is not a simple matter. Choice of equipment and installation should be freely discussed with the fire protection department to get the advantage of that experience. The values involved in storehouses are generally ample to warrant the expense of an automatic sprinkler system, which constitutes the best form of protection when properly planned and installed. Standpipes with hoses at each outlet are valuable only when the details of sizes, locations, etc., are efficiently planned. Hand appliances, such as extinguishers, pump tanks, barrels, pails, etc., all have their advantages and their limitations, and money can easily be wasted on an injudicious installation. Pike poles are a valuable aid in pulling down or in turning over piles of burning materials.

Separate Brigade for Stores

Many supply properties are part of a large shop plant and have the advantage of general fire service, but even in such cases, the stores department should have its own company in the plant brigade. The advantage of a separate storehouse fire company lies in the fact that it can be instructed in the combustibility and damageability of materials and trained to protect stock against water and smoke damage and theft as well as to extinguish a blaze. In any event, an employee assigned as fire marshal for the general instruction of the staff and regular checking of hazards, maintenance of apparatus, and yard conditions is desirable. This need not conflict with the responsibility of others if well planned. An inspection is warranted at the closing of each day.

Untested alarm boxes, empty extinguishers, untrained employees and poor water supply have cost the railroads many thousands of dollars. Capable watchmen should cover the premises whenever not open for regular business, registering on approved clock from stations carefully located so that their route will bring them within vision of all parts of the plant at intervals of not more than one hour each. Rooms or sections to which watchmen are not permitted access should be arranged to allow both sight and smell of the interior. Neglect of this has been responsible for storehouse fires.

Stock books, invoices, and other important papers should be definitely provided for by arrangements whereby responsible persons shall see that in case of fire alarm they are properly safeguarded.

The use of tractors and trucks is rapidly increasing and the hazards of cleaning, repairing and fueling are sufficient to warrant separate detached garages of superior construction. Supplying gasoline from underground tanks with approved pump is important.

THE EXTENSIVE ELECTRIC INTERLOCKING PLANT of the Boston & Albany at Springfield, Mass., which has been under construction for a year past was finally placed fully in service on October 3. The new Union station of Springfield was first occupied for business in December, 1926. This interlocking, which controls the switches, not only at the station but at the junctions of the New York, New Haven & Hartford on the south and the Boston & Maine on the north, has 185 working levers. The cost of this signaling, exclusive of the tower, is said to have been \$485,000.

Freight Car Derailments

A discussion of known and unknown wheel and rail reactions—Field for research is large

By T. H. Symington

WHEN freight cars were all of small capacity, with low center of gravity and very flexible, they would not derail, when in fair condition, on track somewhat out of line or surface, or on average worn rail on curves.

Modern freight cars are of large capacity, high center of gravity and many are very rigid. Lower transportation costs necessitate the large capacity car, and the rigid car costs less to maintain than the flexible car. The savings thus effected are in some measure offset by the far greater construction and maintenance cost of the better track required for satisfactory operation of modern equipment.

The high capacity rigid freight car now in general use on American railroads will not be entirely satisfactory until it will never derail, when in fair condition, on track that is not perfect in line and surface, and with average worn rail on curves. Derailments caused by obstructions on track are not under consideration. It is impracticable always to maintain all main line track in such perfect condition that modern freight cars with the

wheel flange pressure against the rail caused by curving resistance, and second, an unloading of the truck spring on the same side of the truck, caused by warp in the track. Many high gravity freight car derailments on tangents also occur as the result of two simultaneous

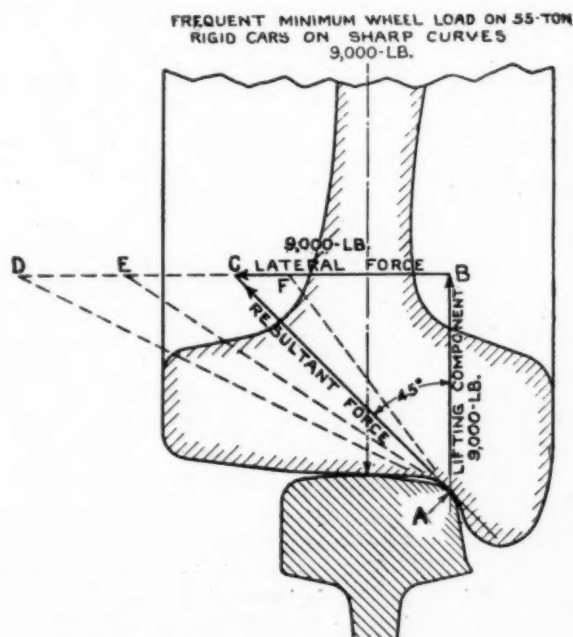


Fig. 1—Resultant Force Line for a New Wheel on an Average Worn Rail

present standard truck construction will not sometimes derail.

Almost every important railroad in the United States has given separate consideration to freight car truck springs and side bearing clearance in connection with derailments and spring failures, and as these springs are also vital factors in connection with the life of rails, the time seems opportune to discuss the entire subject.

Many rigid freight car derailments on curves occur as a result of two simultaneous conditions: first, high

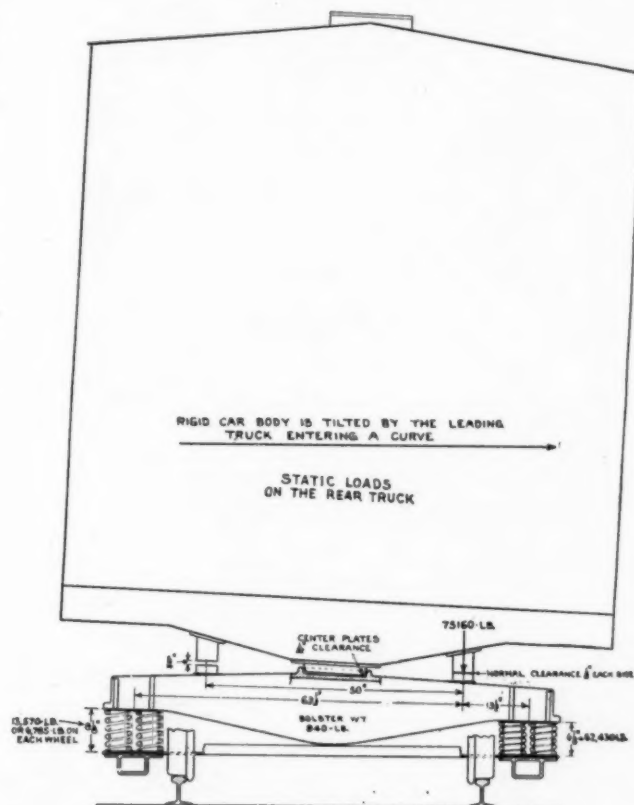


Fig. 2—A Rigid Car Body Supported on Diagonally Opposite Side Bearings Under the Influence of Maximum Track Warp on Entering a Curve—Minimum Side Bearing Clearance

conditions: first, some wheel flange pressure against the rail, caused by trucks not squaring themselves after coming out of a curve, and second, by excessive car roll that may lift the wheel off the rail.

We cannot eliminate high wheel flange pressure on standard freight cars with present truck construction, because of center plate and side bearing frictional resistance. It is important, therefore, to minimize the unloading of the truck springs on curves and also to minimize car roll. Wheel flange pressure on curves is at its maximum when the car is loaded, because curving resistance increases with the car weight. The center of gravity of the loaded car is much higher than that of the light car and therefore the tendency to roll is greater for the loaded car.

Fig. 1 shows a frequent relative condition of rail and wheel flange that may permit the wheel flange to climb

the rail when there is high lateral pressure from curving resistance, and an unloading of the truck spring. The rail is average worn and the wheel is new. If there were no static transverse friction at point *A* the force diagram in full lines shows that the lifting component *AB* equals the lateral force *BC*, and the resulting force is *AC*. There is transverse friction at *A*, so that the resultant force *AC* may move to, say *AD*. When the wheel flange is rolling against the rail with high lateral pressure, the surface of the wheel flange has a tendency to gear itself to the surface of the rail head and lift the wheel. The resultant force *AD* is thereby moved to, say *AE*, or possibly to *AC*. With unusual wheel and worn rail contours it may move to *AF*. If the resultant force is at *AC* any more than 9,000 lb. pressure of the wheel flange against the rail will lift the wheel. If the

side bearings are spaced 50 in. apart. This wheel load on the rail with minimum spring pressure of 6,785 lb. added to its dead weight equals about 9,000 lb. and can only be reduced by a single car roll on a curve or by cumulative car roll on a tangent. This reduced weight is sometimes not sufficient to keep the wheel flange from climbing the rail, as the flange pressure against the rail is then at its maximum.

With 9,000 lb. wheel load on the rail (see Fig. 1), it is evident that if the resultant force is at a less angle than 45 deg. with these wheel and rail contours, the wheel will climb the rail with a lateral flange pressure of 9,000 lb. The importance of minimizing wheel flange pressure against the rail to prevent derailments is obvious.

Unloading of Truck Springs

There are two kinds of unloading of truck springs. First, the unloading that occurs on very rigid body cars on curves, when the track is highly warped, and second, the unloading that may occur on high gravity cars because of excessive car roll.

When a car is entering a curve at fair speed and is tilted to the inside rail, a sudden change of line or surface in the track may cause the car body to roll to the inside of the curve and cause the truck springs to go solid. If the roll is sufficient, the resultant force line passes outside of the rail, and the entire car and truck may rotate on the rail and lift the opposite wheels with a resulting derailment, as shown in Fig. 3.

If the single roll on a curve or the cumulative roll on a tangent is not quite sufficient to lift the car wheel on the opposite side, a dynamic upward force on the wheel on this opposite side may cause the wheel to lift off the rail. This dynamic force would come from a sudden inequality in the surface of the track. The dynamic augment on the closed truck spring from excessive car roll depends upon the rolling velocity of the center of gravity of the car at the instant of spring closure. This dynamic augment is responsible for excessive bearing stresses in the rail head from car wheels.

Unloading of truck springs occurs on tangents as a result of car roll only. This roll results from track inequalities, such as low joints, etc. Synchronous car roll on tangent track may also cause the truck springs to go solid, as shown in Fig. 3, and break or take permanent set. It also occasionally results in derailments. Synchronous car roll is more pronounced with high gravity cars, particularly when they have large side bearing clearance.

Prevention of Car Roll

Car roll can be greatly reduced by work absorption. The frictional resistance of elliptic springs will dampen cumulative roll, but adequate elliptic springs have not been placed in standard freight car trucks. Car roll is always accompanied by lateral thrust and this force when lifting the car through lateral motion will greatly reduce car roll. Any lateral motion to be fully effective must produce adequate lift fully to absorb this lateral force without shock and with positive return to the central position. There are many different types of truck design that can be utilized.

The development of a satisfactory work absorption truck spring, or other bolster supporting means, will also break up cumulative car roll and act to prevent derailments which may result therefrom.

Side Bearing Clearance

On old style flexible cars, large side bearing clearance was necessary to take care of the deflection under load

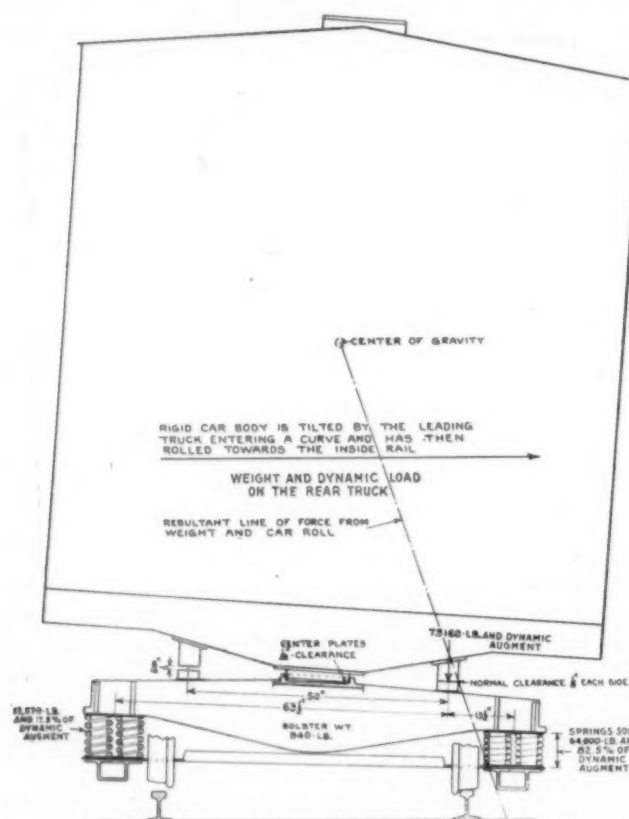


Fig. 3—Conditions Which May Result from Rolling of the Car Body When the Car is Entering a Curve

resultant force is at *AE* a dangerous limit of flange pressure is 13,500 lb. and if the resultant force is at *AD* the dangerous limit of flange pressure is 18,000 lb.

When a very rigid car is running into a curve with maximum warp in the track, the whole car is tilted by the leading truck, and with minimum side bearing clearance, the rear end of the car is supported entirely on one side bearing only. The other end of the car has then its main support on the diagonally opposite side bearing. This condition is shown in Fig. 2 and it will be noted that the center plates are not in contact.

Under these circumstances the curving resistance of this rear truck is largely increased, because the lever arm of the entire curving resistance is 25 in. long. This results in high pressure of the opposite forward wheel flange of this rear truck against the rail. The static spring load on this wheel is then 6,785 lb. It is impossible to have a static spring load on one wheel of less than 6,785 lb. on a fully loaded 55-ton car when

standard spring nest on any derailed car. Its free height should be $8\frac{1}{2}$ in., its light car height should be $8\frac{3}{4}$ in., and its fully loaded height should be $7\frac{1}{2}$ in.

To meet the problem of reduced capacity, the number of standard spring coils can be increased and thereby increase the capacity of the spring group. Car roll may give these larger spring groups a permanent set and the progressive loss of capacity and travel in service is simply deferred.

Where truck springs with a rated capacity of 64,000 lb. for 55-ton cars and 80,000 lb. for 70-ton cars have been found inadequate, the actual capacity of the 55-ton car spring would often not exceed 48,000 lb. and

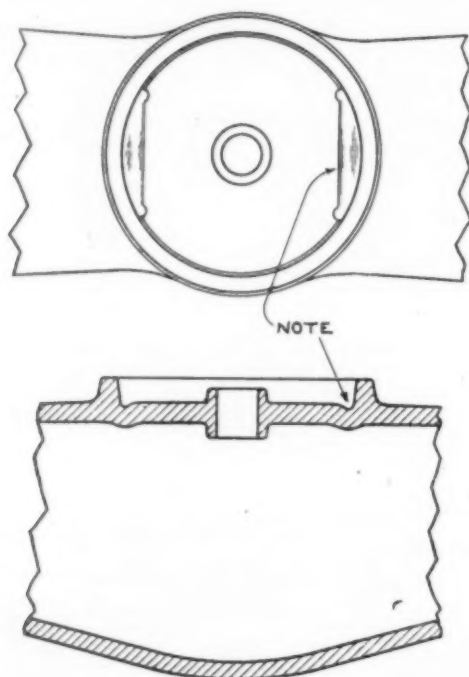


Fig. 5—Suggested Form of Truck Center Plate to Protect the Body Center Plate when Tilting

the 70-ton car spring would often not exceed 60,000 lb. because they had both taken a permanent set which is the result of car roll on too soft springs. If the standard truck spring nests with their rated capacity go solid in service when excessive car roll is prevented, then only would it seem necessary to increase the capacity of the spring group by adding coils or by using stiffer coils.

If car roll is prevented, the A.R.A. standard spring nests properly made will, I believe, maintain their travel and sufficient capacity, and A.R.A. standard side frames and bolsters are thereby maintained. It would seem desirable to have truck springs break when overstrained instead of taking a set, because a broken coil can be seen and replaced. The spring that has taken a set is too often allowed to run, and may ultimately cause trouble.

Types of Truck Springs

Freight car truck springs in general use can be divided into three groups, as follows:

Type	Travel	Full load, 55-ton car	Approx. capacity, 55-ton car	Approx. fibre stress at closure
Standard A.R.A.....	$1\frac{1}{4}$ in.	38,000 lb.	64,000 lb.	80,000 lb.
Baltimore & Ohio....	2 in.	38,000 lb.	88,000 lb.	80,000 lb.
Norfolk & Western..	$1\frac{3}{4}$ in.	38,000 lb.	98,000 lb.	80,000 lb.

These different spring coils are used in different groupings for 40, 55 and 70-ton cars in order to get the desired capacity.

A.R.A. Standard Coil—This spring coil, properly

made, would I believe, be generally satisfactory in the various standard groupings for different capacity cars, if car roll is prevented. Its fibre stress when closed is 80,000 lb. Its travel of $1\frac{11}{16}$ in. is always augmented by more or less side bearing clearance to prevent derailments of rigid cars on curves. This spring coil is probably used on 90 per cent of the cars in service today.

Baltimore & Ohio Spring Coil—This spring coil has a travel of 2 in. and a fibre stress at closure of 80,000 lb. Its free height is 11 in. and therefore it cannot be used in A.R.A. standard trucks. With 2 in. travel, car roll should be dampened by some means.

Norfolk & Western Spring Coil—This spring coil is of standard height and fits the standard truck. It has $1\frac{3}{8}$ in. travel and its fibre stress when closed is 80,000 lb. Four double coils for 55-ton cars have a capacity of 98,000 lb. and five double coils for 70-ton cars have a capacity of 123,000 lb. This spring, properly made, should have long life, if car roll is prevented, because of its low fibre stress under normal working load. It will break when it goes solid from car roll as readily as any other coil. The only disadvantage of this spring coil is its reduced travel. With its low fibre stress under normal load this spring should not take permanent set if car roll is prevented, and its sustained travel of $1\frac{3}{8}$ in. will after short service exceed the $1\frac{11}{16}$ in. travel of the standard spring coils that do take permanent set when car roll is not prevented. Its capacity of 123,000 lb. in five coils for 70-ton cars exceeds by 11,000 lb. the capacity of seven A.R.A. coils.

Flexible cars should not derail on curves even with short travel springs and small side bearing clearance, because the truck springs are never unloaded. If the flexible car is of high gravity, car roll must be minimized. Adequate roller side bearings are desirable only to reduce wheel flange and rail wear and to reduce train resistance. Well made springs of any travel and of sufficient capacity are satisfactory if car roll is prevented.

If short travel springs are used on rigid cars, larger side bearing clearance must be provided to prevent spring unloading and derailments on curves, and car roll must be prevented in order to maintain the designed spring travel and capacity. If long travel springs are used, car roll must be minimized to insure the permanence of the long travel and to avoid derailments when the springs roll solid.

Adequate roller side bearings are more desirable on rigid cars, because wheel flange pressure is said to be less with roller side bearings than with friction side bearings, and when the truck springs unload on a curve there is, therefore, somewhat less tendency for the wheel flange to climb the rail.

A good inspection rule for spring travel and side bearing clearance for rigid cars might be that the actual truck spring travel plus two and one-half times the side bearing clearance on one side should never be less than $1\frac{7}{8}$ in. With standard A.R.A. springs and $\frac{1}{8}$ in. side bearing clearance on each side this figure is 2 in.

If high pressures between wheel flanges and rails are eliminated, a very large percentage of freight car derailments are eliminated, regardless of the type of truck spring used.

If freight cars are equipped with adequate lift lateral motion trucks, or other work absorption means, so that car roll is minimized, the spring problem is solved. Springs will then not go solid and break or take a set, that sometimes results in very rigid cars derailing on curves and high gravity cars derailing on tangents. Damage to rails from car wheels is also thereby minimized.

Recent tests of freight train curving resistance, made at the University of Illinois, and reported by Professor Edward C. Schmidt, in the *Railway Age* of September 10, 1927, are very illuminating. The general average curve resistance at various speeds for all trains tested was .51 lb. per ton per degree on a level one-degree curve and .54 lb. per ton per degree on a level three-degree curve. This means that the curving resistance on a three-degree level curve equalled 1.62 lb. per ton, or 32.8 per cent of the average rolling resistance on straight track as recorded in these tests.

The study of this entire subject has become one of major importance since the advent of modern, high capacity, high gravity, rigid cars.

We do not know what the shock pressures on a rail are when the truck springs go solid through car roll.

We do not know how much work absorption is needed to prevent cars rolling their springs solid.

We do not know what the lateral pressure is between the wheel flanges and the rail when cars are curving with different types of trucks.

We do not know what the derailing flange pressure from curving resistance is with different types of cars and trucks, and on differently worn rail.

We do not know the effect on wheel flange pressure of varying side bearing clearance.

We do not know the effect on wheel flange pressure of roller side bearings.

We do not know the effect on wheel flange pressure of lubricated center plates and plain side bearings.

We do not know what the lateral shock stresses are on rail with and without the use of lateral motion trucks.

We do not know what the lateral shock stresses are from guard rails, that sometimes break wheel flanges, with and without lateral motion trucks.

We do not know the relative curving resistance of rigid and flexible trucks.

We do not know whether we need or do not need self-squaring trucks.

We do not know how much train resistance can be reduced by minimizing curving resistance and resulting flange friction on curves and tangents.

We do not know how much we can increase the life of wheel flanges and rail by minimizing flange friction.

We have almost as many theories on all these vital subjects as there are major railroad systems in this country.

This particular field for research is certainly a large and attractive one.

Car Requirements To Be Less

WASHINGTON, D. C.

TRANSPORTATION requirements for 27 of the principal commodities in the fourth quarter this year (October, November and December), are estimated at approximately 174,000 cars below those of the same period last year, or a decrease of 1.9 per cent, in reports received by the Car Service Division of the American Railway Association from the 13 Shippers' Regional Advisory Boards.

On the basis of these reports, compiled from information collected by the various commodity committees of the 13 boards, the Car Service Division estimates that 9,232,000 cars will be required to move those commodities in the last three months this year, as compared with 9,406,000 cars for the same months in 1926.

Of the 13 boards, six estimated an increase in transportation requirements for the last three months of the year, while the other seven estimated a decrease. The

six boards estimating an increase over the preceding year were the Middle Atlantic States, Ohio Valley, Northwestern, Central Western, Pacific Coast and the Pacific Northwest.

The estimates by the Shippers' Regional Advisory Boards as to freight loadings by cars anticipated for the 27 principal commodities in the last three months of this year compared with the corresponding period in 1926 and the percentage of increase or decrease are as follows:

Board	1926	1927	Per cent of increase or decrease
New England	165,394	165,310	Decrease
Middle Atlantic States	1,073,916	1,088,766	1.4 Increase
Ohio Valley	1,240,622	1,265,355	2.0 Increase
Northwestern	379,845	427,298	12.5 Increase
Central-Western	338,178	342,200	1.2 Increase
Pacific Coast	381,205	416,611	9.3 Increase
Pacific Northwest	305,881	322,104	5.3 Increase
Allegheny	1,397,133	1,309,373	6.3 Decrease
Great Lakes	571,470	528,804	7.5 Decrease
Southeastern	1,208,688	1,145,553	5.2 Decrease
Middle-Western	1,206,643	1,129,649	6.4 Decrease
Trans-Missouri-Kansas	402,681	401,821	.2 Decrease
Southwestern	734,732	689,509	6.2 Decrease

On the basis of the information submitted the Car Service Division estimates that of the 27 commodities, increases in transportation requirements will be required for 14, as follows: All grain; flour, meal and other mill products; potatoes; other fresh vegetables; clay, gravel, sand and stone, including gypsum, crude and powdered; petroleum and petroleum products; sugar, syrup, glucose and molasses; cement; lime and plaster; agricultural implements and vehicles other than automobiles; fertilizers of all kinds; paper, printed matter and books; chemicals and explosives; and, canned goods, which includes all canned food products.

Commodities for which a decrease is estimated include: Hay, straw and alfalfa; cotton; cotton seed and products, except oil; citrus fruits; other fresh fruits; live stock; coal and coke; ore and concentrates; lumber and forest products; iron and steel; castings, machinery and boilers; brick and clay products; and, automobiles, trucks and parts.

The estimated transportation requirements for various commodities for the fourth quarter compared with the same period last year are as follows:

Commodity	Percentage	
	Increase	Decrease
All grain	7.5	...
Flour, meal and other mill products	3.9	...
Hay, straw and alfalfa	...	12.0
Cotton	...	24.4
Cotton seed and products, except oil	...	21.9
Citrus fruits	...	3.0
Other fresh fruits	...	16.5
Potatoes	2.9	...
Other fresh vegetables	.1	...
Live stock	...	1.3
Coal and coke	...	2.0
Ore and concentrates	...	5.9
Clay, gravel, sand and stone	2.6	...
Lumber and forest products	...	2.6
Petroleum and petroleum products	3.0	...
Sugar, syrup, glucose and molasses	3.4	...
Iron and steel	...	3.7
Castings and machinery	...	7.6
Cement	3.9	...
Brick and clay products	...	4.2
Lime and plaster	.6	...
Agriculture implements and vehicles other than automobiles	.7	...
Automobiles, trucks and parts	...	1.6
Fertilizers, all kinds	2.0	...
Paper, printed matter and books	6.6	...
Chemicals and explosives	10.3	...
Canned goods, which includes all canned food products	.9	...

Total loading of revenue freight to October 1 this year, as compared with that of the corresponding period of the two previous years follows:

	1927	1926	1925
Five weeks in January	4,524,749	4,428,256	4,456,949
Four weeks in February	3,823,931	3,677,332	3,623,047
Four weeks in March	4,016,395	3,877,397	3,702,413
Four weeks in April	4,890,749	4,791,006	4,710,903
Four weeks in May	4,096,742	4,145,820	3,869,306
Four weeks in June	3,974,160	4,089,340	3,965,872
Five weeks in July	4,935,397	5,213,759	4,945,091
Four weeks in August	4,249,359	4,388,118	4,321,427
Four weeks in September	4,360,022	4,523,112	4,297,936
Week ended October 1	1,126,390	1,180,049	1,113,283
Total	39,997,894	40,314,189	39,006,227

Erie in Promising Position

*Results of Bernet management should begin to show
with installation of new power—Dividend possibilities*

UNQUESTIONABLY, the Erie has today the most promising prospects that it has ever had at any time in its long and checkered career. Whether the promises are sufficient to justify the present high quotations on Erie stocks might be a fair question. Those who are willing to pay these high prices evidence their confidence in the ability of the Van Sweringens to make money even in Erie. Van Sweringen control has meant Bernet management and no doubt there is a general expectation that J. J. Bernet will prove able to make the Erie prosperous with the same skill he showed in transforming the Nickel Plate from a second rate property into one of the leading factors in the traffic situation and the railroad strategy of trunk line territory. It is possible that the values of Erie stocks are also increased a few points by the hope that the Interstate Commerce Commission will allow the Chesapeake & Ohio to acquire control of the Erie as planned in the present merger proposals.

The Erie has three issues of stock, first and second preferred and common. The first preferred has had a price range thus far in 1927 between 52½ on January 4 and 66¼ on August 4 and is now selling at about 62. The second preferred has closely paralleled it with a price range between 49 and 64½ and is now selling at about 61. The preferred issues are both 4 per cent non-cumulative. If the dividends were being paid the prices would give a yield of 6½ per cent. A large number of the stocks of industrial companies paying dividends of \$4 a share sell on the stock exchange at the present time at prices below these non-dividend Erie preferred issues. The common stock reached its 1927 low on January 3 with 39½. It had a high price on September 30 of 69¾ and is now selling not far from the last named figure. At one time in 1922 this stock could have been bought at 7. In 1923 it had a price range between 10½ and 22¾; its high in 1926 was 42.

The Erie is controlled by the Van Sweringens through the Vaness Company and the Chesapeake & Ohio. The Erie stock controlled by the Chesapeake & Ohio is all held by a subsidiary company known as the Virginia Transportation Corporation and the Chesapeake & Ohio has been given an option which allows it to purchase—the Interstate Commerce Commission being willing—all of the Erie stock held by the Vaness Company. The holdings were as follows, on May 1, 1927:

	NUMBER OF SHARES			
	Common	1st Preferred	2nd Preferred	Total
Owned by Chesapeake & Ohio	357,300	137,405	50,495	545,200
Optioned	345,239	23,695	22,305	391,239
Total	702,539	161,100	72,800	936,439
Total outstanding	1,124,819	479,044	160,000	1,763,863
Per cent owned	31.8	28.7	31.5	30.9
Per cent optioned	30.8	4.9	14.0	22.2
Total	62.6	33.6	45.5	53.1

The common stock owned was acquired at an average cost per share of \$38.58 and the option calls for a price of \$34.50.

Bond Conversions

From the figures given above, it will be observed that the Erie's total outstanding stock on May 10, 1927, totaled \$176,386,300. The amounts have been slightly changed since by the conversion into stock of series D, 4 per cent convertible bonds which had the privilege of conversion in a ratio of \$100 of bonds into \$200 par value of stock until October 1, 1927. The total of these bonds outstanding in the hands of the public on December 31, 1926, was \$19,627,100 and all but \$309,200 were converted. The amount of common stock outstanding was, therefore, increased by \$38,635,800 and is now \$151,117,700.

The Erie this year sold \$50,000,000 5 per cent refunding and improvement mortgage bonds, the issue being offered to the public at 94½. The proceeds were used to

Erie, Operating Results, Selected Items

	YEARS ENDED DECEMBER 31, 1916 AND 1920 TO 1926									
	1916	1920	1921	1922	1923	1924	1925	1926	1927	
Average mileage operated.....	2,257	2,259	2,309	2,309	2,325	2,325	2,323	2,317		
Total operating revenues.....	\$74,311,262	\$122,163,099	\$113,428,076	\$106,874,103	\$132,978,435	\$119,090,856	\$118,543,456	\$125,473,504		
Total operating expenses.....	53,453,701	133,014,159	106,117,042	100,101,523	108,070,145	95,784,775	93,238,535	99,173,496		
Net operating revenues.....	20,857,561	Def. 10,851,060	7,311,034	6,772,580	24,908,310	23,312,081	25,304,920	26,300,008		
Railway tax accruals.....	2,220,333	3,804,226	3,729,593	3,863,226	4,260,363	4,521,873	4,750,791	4,868,271		
Railway operating income.....	18,628,600	Def. 14,690,442	3,531,754	2,860,993	20,539,117	18,698,549	20,509,435	21,386,470		
Net equipment and joint facility rents—Dr.	2,147,414	2,303,676	2,369,860	2,216,082	2,218,704	1,626,372	2,978,815	3,333,748		
Net railway operating income.....	16,481,186	Def. 1,319,953	1,161,893	644,911	18,320,413	17,072,177	17,530,619	18,052,723		
Dividend income.....	2,042,420	3,842,942	9,191,700	11,095,150	6,027,537	7,002,537	3,177,537	5,913,995		
Gross income.....	22,382,830	*18,516,983	*16,815,729	11,854,444	23,111,730	24,781,924	21,698,418	24,927,371		
Interest on funded debt.....	10,361,415	10,610,358	10,701,403	10,771,533	10,532,553	11,079,862	10,945,520	10,781,715		
Net income.....	6,027,664	4,438,586	2,694,425	Def. 3,132,770	8,435,273	9,601,629	6,729,307	10,113,393		
Sinking and other reserve funds	881,920	976,015	1,099,171	946,047	1,217,065	1,238,262	1,146,915	1,368,901		
Surplus for year.....	4,631,912	3,462,570	621,452	Def. 4,078,817	7,218,208	8,363,367	5,582,391	8,744,493		
Earnings per share on common stock.....	\$1.85	\$0.83	None	None	\$4.14	\$5.16	\$2.69	\$5.50		
Revenue ton-miles (thousands)...	9,770,367	11,137,692	8,574,212	8,277,801	11,363,377	9,880,513	9,469,280	10,407,368		
Rev. pass. miles (thousands)...	628,395	740,129	683,422	648,421	660,537	666,139	672,065	650,594		
Rev. per ton per mile (cents)...	0.584	0.862	1.065	1.021	0.957	0.966	1.000	0.980		
Total revenue tons.....	44,359,341	46,467,928	34,692,317	36,301,364	50,437,718	43,104,928	42,894,577	46,680,845		
Tonnage of bituminous coal.....	8,636,187	12,036,731	6,959,744	7,797,689	11,534,424	8,343,217	8,334,899	8,856,584		
Per cent of total.....	19.47	25.90	20.06	21.48	22.87	19.36	19.43	18.97		
Tonnage of anthracite coal.....	9,312,088	9,988,829	9,973,687	6,079,508	11,557,800	10,026,306	7,392,567	10,178,531		
Per cent of total.....	20.99	21.50	28.75	16.75	22.91	23.26	17.23	21.80		
Transportation ratio.....	38.55	56.60	46.53	45.46	38.59	38.69	38.52	38.45		
Operating ratio.....	71.93	108.88	93.55	93.66	81.27	80.43	78.65	79.04		
Per cent ret railway operating income to total operating revs.	2.22	1.02	0.60	13.78	14.33	14.79	14.39		

*Includes standard return and guaranty.

retire \$20,299,450 6 per cent collateral trust notes, a \$10,000,000 short term note redeemed one year prior to maturity and current bank loans. The financing had the advantage of clearing up all of the Erie short term indebtedness and important maturities of funded debt until 1930. The road's funded debt now stands at \$213,298,600 in addition to which there are outstanding some \$20,000,000 of equipment trust obligations. The stock outstanding now totals \$215,021,100. The total capitalization is about \$440,000,000 of which the funded debt, inclusive of the equipment obligations constitutes 52 per cent, which proportion would not be so bad if the Erie could only show greater earning power.

It was a feature of early Erie history that it promptly went into receivership in every period of severe financial stringency. In recent years the Erie has shown some improvement. It earned something on the preferred in 1921 but nothing on its common. In 1922, it reported a substantial deficit and since then has been able to report earnings per share on the common stock after allowance for the unpaid and fortunately non-cumulative 4 per cent preferred dividends and after allowance for sinking and other reserve funds, as follows: 1923, \$4.14; 1924, \$5.16; 1925, \$2.69, and 1926, \$5.50.

General Characteristics

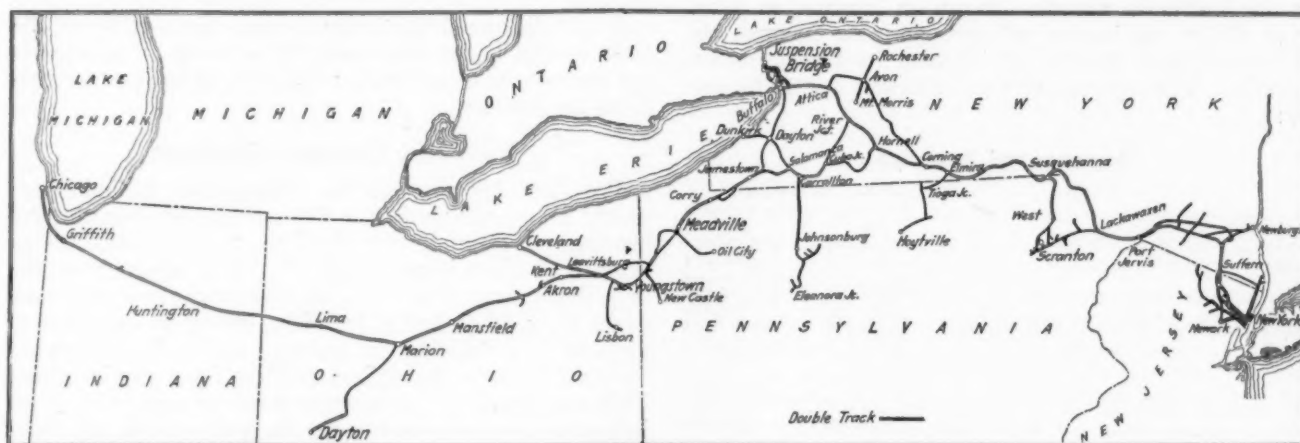
As a railroad, the Erie had been handicapped by its lack of financial strength and inability to secure capital for important capital improvements. The road is gen-

erate stations, etc., all representing that sort of expenditures that yield less net return per dollar expended. Some idea of the Erie's ability to find money to spend out of earnings or by means of equipment trust obligations is given in the brief tabulation of capital expenditures during the past four years shown in the first column on this page. The budget for 1927 calls for an expenditure of about \$28,000,000; the greater part of which will be for equipment.

Traffic

The Erie, as befits its location in trunk line territory, has a diversified traffic. The most important commodities handled are coal and California perishables. In 1926 bituminous coal constituted 19 per cent of the total tonnage, a good portion of which was received from connections. Bituminous coal may be expected to become a more important item of Erie tonnage on account of the community of interest with the Chesapeake & Ohio. The tonnage received from the Chesapeake & Ohio via Hocking Valley at Marion has expanded sharply since the completion of the Chesapeake & Hocking and is reported now to average about 100 cars daily.

The Erie handles also a large volume of anthracite coal, this commodity totaling in 1926, 21.8 per cent of the total tonnage. This coal is received principally from the Erie's own coal subsidiaries which include the Pennsylvania Coal Company; the Hillside Coal & Iron Company, etc. (The Erie owns five coal companies, two of which operate bituminous mines.) The coal operations



The Erie Railroad

erally regarded, however, as being well operated. It has at least had enough net income to allow it to expend large sums for equipment, for improvements of track structure to support heavy equipment, for signals, etc., and its shops are such that one of the reasons offered in favor of the merger with the Chesapeake & Ohio is that the latter will be able to use Erie shop facilities for the repair of its power. It is, however, likely that in future years the Erie will find it necessary to expend large

Year	Road	Equipment			Total
		Equipment	Less credits	Net	
1923....	\$3,203,711	\$18,097,517	\$8,637,803	\$9,459,714	\$12,663,425
1924....	4,022,080	13,323,846	4,222,123	9,101,724	13,123,804
1925....	4,638,795	4,089,040	4,451,739	Cr. 362,699	4,276,096
1926....	4,545,222	4,567,677	2,374,374	2,193,302	6,738,524
	\$16,409,818	\$40,078,080	\$19,686,039	\$20,392,041	\$36,801,849

sums for grade crossing eliminations in New York state and in the thickly settled suburban area in northern New Jersey and at other points as well as for more ade-

quate stations, etc., all representing that sort of expenditures that yield less net return per dollar expended. The Erie purchased the Pennsylvania Coal Company in 1901 at a price of \$40,000,000 and the company has been estimated by one competent authority to have a present value of \$60,000,000 and all five companies a value of \$84,000,000, while others estimate the values to be as high as \$150,000,000. The value of \$84,000,000 is equivalent to \$56 a share on the amount of Erie common stock at present outstanding. The coal properties yield substantial sums in dividends, the average annual receipts from this source having totaled about \$4,100,000 in the 16½ years ended December 31, 1926. The dividend receipts from the coal companies in 1926 totaled about \$5,500,000 which was equivalent to over one-half the Erie's total net income.

Handles Perishable Freight

The Erie handles much the larger proportion of the California perishable freight moving between Chicago and New York, although recently the Pennsylvania, which is also especially equipped at New York on ac-

count of its large tonnage of Florida perishables, has succeeded in obtaining about 20 per cent of the business. The Erie has on occasions complained that it receives an inadequate division of the rate from California points and the fact that the traffic moves in refrigerator cars, on which mileage payments must be made, does not help the situation. The Erie, however, solicits the business assiduously and leaves nothing undone to give prompt third morning delivery at the New York end.

Rate Structure

The Erie appears to suffer as relates to its rate structure. Its average receipts per ton-mile in 1926 were only 0.980 cents. These compared with the New York Central's 1.051 cents; the Pennsylvania's 1.024 cents; the Lackawanna's 1.31 cents and the Lehigh Valley's 1.156 cents. This helps explain, therefore, the relatively poor ratios of operation and the general lack of earning power which is an Erie characteristic. In 1926, the road had a transportation ratio of 38.45; an operating ratio of 79.04 and its ratio of net railway operating income to total railway operating revenues was 14.39 per cent. The eastern district in 1926 reported a transportation ratio of 35.6; an operating ratio of 74.8 and a net railway operating income ratio of 17.8 per cent.

J. J. Bernet has been president of the Erie since January 1, 1927. He has not been in charge of operations a sufficient length of time to have effected improvements sufficient to show marked changes in the earnings or operating statistics. The latest earnings report—that for the first eight months—shows an increase in gross but a slight loss in net railway operating income, the difference being due to an increase in transportation expenses. The figures, with comparisons for 1926, follow:

Revenues and Expenses

	January 1 to August 31	
	1927	1926
Freight revenue	\$65,816,296	\$64,638,524
Passenger revenue	8,404,915	8,799,074
Total, including other revenues.....	\$80,961,699	\$80,207,888
Maintenance of way.....	9,903,233	9,893,467
Maintenance of equipment.....	19,542,891	19,877,644
Traffic	1,394,854	1,385,075
Transportation	31,843,526	31,001,231
Total, including other expenses.....	\$65,717,322	\$65,130,478
Net operating revenues.....	15,244,377	15,077,410
Taxes	3,380,580	3,400,200
Railway operating income.....	\$11,844,638	\$11,643,383
Net railway operating income.....	9,111,882	9,491,662

New Power

One of the first things that the new management did, however, promises to prove of utmost importance in the Erie's future economy of operations. It announced a budget for 1927 of some \$25,000,000 of which about \$22,000,000 was for new equipment. The latter includes 50 new 2-8-4-type freight locomotives, 30 switch locomotives, 50 new passenger train cars and 25 caboose cars, as well as the equipping of 125 present Mikado locomotives with mechanical stokers and feed-water heaters. The 50 new road freight locomotives are just going into service. Half of them are being supplied by the Lima Locomotives Works; they were described in the *Railway Age* of October 8. The other half are being furnished by the American Locomotive Company and a description of them will be found on another page of the current issue. The locomotives have been put in service between Marion, Ohio, and Meadville, Pa., 203 miles and between Marion and Hornell, N. Y., 477 miles, respectively, and are already showing marked

economies in train-load, train-speed and fuel consumption which will be reflected in due course in the operating statistics and in the transportation and operating ratios.

Equipment Retirement

At the same time, the budget called for the retirement of 327 old locomotives, 270 passenger cars, 4,765 freight cars and a sizeable amount of work equipment. It is noteworthy that none of the freight cars are to be replaced. The total book value of the equipment to be retired will be \$8,400,101. The Erie is desirous of charging off the amounts in excess of the accrued depreciation to profit and loss but if the Interstate Commerce Commission should not permit this there will have to be a substantial charge to retirements and operating expenses, namely about \$4,900,000, which, if made, will very likely have an adverse effect on the price of Erie stock. The retirement program is already nearly carried out. On January 1, 1927, the Erie reported the ownership of 1,456 locomotives but on September 1, 1927 it reported only 1,217. On September 1, also, it reported that 21.1 per cent of its power was held for repairs as against only 13.3 per cent on January 1. The number of locomotives stored in serviceable condition on September 1, 1926, was 234, on January 1, 1927, 131 but on September 1, 1927, only 14. This equipment situation does not look promising but, of course, the entire situation is changed by the delivery of the 50 new road freight locomotives and also the 30 new switch engines.

It will be noted that only a small proportion of the 1927 budget is for improvements to road. No important large items of capital charges for roadway and structures are included.

President Harahan's Forecast

President Harahan of the Chesapeake & Ohio presented as an exhibit in the Chesapeake & Ohio merger hearings an estimate that the Erie could be expected to show a marked improvement in its earnings over the next few years. For 1927, he estimated about the same gross as in 1926, but a sufficient saving in expenses to yield \$6.95 a share on the common stock after allowance for preferred dividends and sinking fund requirements. This was provided the equipment retirements referred to in a preceding paragraph were charged to profit and loss; if they were charged to retirements in 1926, he estimated the 1927 per-share earnings at \$1.93. He expected a progressive improvement each year following and 1931 results of \$14.00 a share; an operating ratio of but 72.6 and a transportation ratio of 36.5. For each year he allowed a dividend income of \$5,304,000 as against the \$5,913,995 actually received in 1926. If Mr. Harahan's estimates of per-share earnings were adjusted to the basis of the amount of common stock outstanding since the conversion of the series D bonds, his 1927 estimate would become about \$5.17 a share and his 1931 estimate about \$10.40. Earnings in 1926 actually were \$5.50 on the former capitalization which would be equivalent to \$4.10 on the present common stock outstanding.

THE CHICAGO, MILWAUKEE & ST. PAUL is now distributing to the public a folder entitled "Flashes" which contains information of general interest regarding railway problems. The issue for October calls attention to the taxes which the railroads pay back to the public and discusses railway electrification, showing the number of miles in operation and the number of miles in the United States.

Railways Still Handle 90 Per Cent of Country's Freight

Daniel Willard emphasizes reasons why public welfare requires they be allowed to earn adequate returns

DANIEL WILLARD, president of the Baltimore & Ohio, delivered an address to an audience of about fifteen hundred persons who attended a luncheon given under the auspices of the Transportation committee of the Illinois Chamber of Commerce at the Palmer House in Chicago on October 14. Speaking on the subject "Transportation in the United States," Mr. Willard gave statistics he had compiled indicating that the freight service rendered by the different transportation agencies in 1926 was about as follows: By steam railroads, 447,500,000,000 ton-miles, or 90.5 per cent of the total; by inland waterways, 28,500,000,000 ton-miles, or 5.8 per cent; by trucks, 18,400,000,000 ton-miles, or 3.7 per cent. Continuing, he said in part:

"The best estimates I have been able to obtain indicate that in 1926 motor buses, in competition with the railroads, carried 120,000,000 persons an average distance of probably not over 30 miles, making an aggregate performance of 3,600,000,000 passengers carried one mile. During the same period the steam railroads actually carried 875,000,000 persons an average distance of 40 miles, or a total aggregate service of 35,750,000,000 passenger miles, roundly 88 per cent of the whole. I have not included in my calculation the service of the electric lines because usually such lines are not in competition with the steam roads. No figures are available concerning the number of people traveling in privately owned motor vehicles. I think it may fairly be said, however, that at the present time the steam railroads are performing approximately 90 per cent of the freight transportation for hire in the United States, and 88 per cent of passenger transportation.

"I think it will be generally conceded that the railroads as a whole are furnishing a higher standard of service today than ever before in our history, and at rates lower than obtain in any other country where conditions are at all similar, and relatively lower than have been obtained before in this country. Assuming that this last statement is correct, it might be asked—what is there then in the situation to talk about? If it were a fact, which happily it is not, that our country had stopped growing and consequently the present equipment and facilities would continue to be ample to meet all future requirements, there might not be any particular thing in the situation deserving of our consideration at this time.

"Believing, as I do, in the potency of a concrete fact or example, I will illustrate my point by particular reference to the Baltimore & Ohio Railroad, of which I have been President for nearly eighteen years. Since I became president of the company we have spent more than \$400,000,000 for additions and betterments to the property including new equipment, which is at the rate of something more than \$23,000,000 each year, and I believe it will be necessary for us to spend annually for some years to come upwards of that same amount.

Vast Capital Expenditures Required

"A very important problem confronting the Baltimore & Ohio, therefore, is how is this new capital to be ob-

tained? Obviously we can only obtain it from willing investors and we will not be able to obtain it from them unless they believe that money invested in Baltimore & Ohio securities will yield at least as good return as could be obtained elsewhere and with just as much security as to principal. In short, we can obtain the new capital needed if our credit is satisfactory, and we cannot obtain it otherwise. During the last seventeen years which I have been discussing, all the railroads in the United States, including the Baltimore & Ohio, spent \$9,500,000,000, an average of \$560,000,000 a year for additions and betterments, the Baltimore & Ohio capital expenditures being about 4 per cent of the whole. The problem just alluded to, therefore, is one which confronts all of the railroads and not simply the Baltimore & Ohio.

"You will perhaps be surprised when I tell you that with the exception of some \$80,000,000 taken from surplus earnings during the period under consideration, all of the \$400,000,000 spent by the Baltimore & Ohio for additions and equipment was obtained by increasing the mortgage upon the property—a process which I hardly need say should not be, and in fact can not be, followed beyond certain very definite limits. While in our case the limit had not actually been reached, it had none the less been approached, and we recognized the desirability of readjusting our capital structure, which we recently were able to do by the sale of a substantial amount of our common stock. With the money realized through the sale of additional stock we expect to reduce our funded debt to such an extent that the ratio between our capital stock, representing the stockholders' equity in the property, and our outstanding bonds and other fixed interest-bearing securities, will be as one to two instead of one to three as was the ratio before we increased our share capital.

Nation Is Still Growing

"Again I may say that if we as a nation had stopped growing, the Baltimore & Ohio might now consider itself in very satisfactory circumstances, but fortunately as a nation we expect to grow and expand and on that account we must continue to enlarge our facilities if we are to keep in condition to furnish the public, or our part of it, with "adequate transportation at reasonable rates," as the Transportation Act prescribes. In the words which I have just quoted from the act, Congress has set up a definite standard of performance for the railroads, and recognizing that it is still a fact that bricks can not be made without straw—straw in the present case being synonymous with credit—Congress also set up a formula for the guidance of its agent, the Interstate Commerce Commission, concerning the fixing of rates. The members of Congress who voted for the Transportation Act realize clearly that private ownership of the railroads would not be a success and therefore could not continue unless the railroads as a whole were able to raise each year a large sum of money, probably more than half a billion dollars, for necessary additions and betterments, and with that thought in mind the

Transportation Act was framed and passed. "The commission has fixed 5¾ per cent as a fair return within the meaning of the act, upon the value of the railroad property devoted to transportation purposes, and, for the purpose of establishing a basis for current rates, announced a tentative valuation of the property so used, and while the basis so fixed is below what the railroads generally believe it should be, the roads, as a whole, have not been able in any year since the passage of the act, to earn thereon, including subsequent expenditures, the percentage return which the Commission itself has said would be fair, although the result was nearly reached in 1926.

"I am confident that under the terms of the Transportation Act of 1920 it is possible to so regulate the railroads that the public will receive adequate transportation at reasonable rates as the law requires, and at the same time enable the carriers so regulated to build up and establish a basis of credit sufficient to justify and encourage investors to advance the large amount of new capital required each year for additional equipment, extensions and betterments.

"I have sketched the rough outline of the transportation or railroad problem as I see it at this time. Of course, within the general outline are to be found such important and still unanswered questions as have to do with the consolidation of railroads into a comparatively small number of groups as recommended by Congress, the proper economic co-ordination between the railroads and motor vehicles and also between the railroads and the waterways, etc., but all of these can and I believe will be settled and settled right under the existing act.

"In announcing a policy favoring the consolidation of the railways of the United States into a comparatively small number of well-rounded systems, Congress was no doubt influenced by the fact that we already have a number of such systems, notably the Santa Fe and Southern Pacific in the west, and the Pennsylvania and New York Central in the east. Such a policy is in no sense an experiment but is supported and justified by results already achieved. All will admit, I am sure, that the public is better served by the Pennsylvania system as it is, than it would be if the system were dissolved into its original component parts, one hundred or more in number. There are 275,000 miles of first main track of steam railroads in the United States, enough to make twenty-five systems of the same length as the Pennsylvania, and I am confident that if twenty-five well-rounded systems could be made to take the place of the several hundred now existing, the public could be better served by such an arrangement and probably at a somewhat lower cost, although the economies to be realized would very likely not be so great as some have claimed or suggested.

"Since January 1 this year, more than \$100,000,000 of new capital stock has been sold by the steam railroads, not including other issues proposed but not yet consummated. This would seem to indicate a renewed confidence in railway securities, just as Congress expected would result from the passage of the Transportation Act. While no one would claim that the Transportation Act of 1920 is perfect, nevertheless in my opinion it contains the best general plan for the regulation of railroads that has so far been tried in this country and if interpreted and applied as Congress clearly intended it should be, I believe the railroads can be successfully operated thereunder. An imperfect act well administered is much to be preferred to a constantly changing policy. Investors have shown their willingness to purchase railway securities under existing conditions, but any change in the law would disturb, at least temporarily, the con-

fidence of investors and, what is equally bad, if not worse, it would create in the minds of railway managers such a feeling of uncertainty concerning the future that they would hesitate, and rightly so, to undertake large capital expenditures for additions and extensions, even though such additions or extensions might be needed.

"The railroads are not asking for anything—at least I am not—except the opportunity to operate under the terms of the existing Act, and given that opportunity they will, I am convinced, furnish the people of this country with adequate transportation at reasonable rates, which is the standard for performance set up by Congress in the act itself."

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading during the week ended October 8 totaled 1,100,552 cars, a decrease of 25,838 cars from the preceding week, due principally to a drop of 18,281 cars in loadings of miscellaneous freight. Livestock and less-than-carload merchandise were the only commodity classifications which showed a gain, and loadings in all districts, with the exception of the Central Western, were lighter.

The total loadings for the week were 74,376 cars less than in the corresponding week of last year, with coal, ore and miscellaneous freight showing the principal decreases. Coal loadings amounted to 190,929 cars as compared 221,916 cars in the corresponding week of 1926. Decreases were shown in loadings in all districts. The summary, as compiled by the car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Districts	WEEK ENDED SATURDAY, OCTOBER 8, 1927		
	1927	1926	1925
Eastern	238,288	258,172	242,157
Allegheny	215,203	238,817	213,750
Focahontas	62,243	62,698	59,972
Southern	162,407	167,764	166,171
Northwestern	168,782	183,798	167,519
Central Western	171,164	173,504	171,048
Southwestern	82,465	90,175	85,419
Total Western districts	422,411	447,477	422,986
Total all roads	1,100,552	1,174,928	1,106,036
Commodities			
Grain and grain products	49,902	47,534	43,303
Live stock	38,689	40,771	44,616
Coal	190,929	221,916	184,649
Coke	9,455	13,290	12,825
Forest products	65,029	71,090	71,033
Ore	52,123	69,631	52,006
Mdse. L. C. L.	271,439	270,964	271,219
Miscellaneous	422,986	439,732	426,385
October 8	1,100,552	1,174,928	1,106,036
October 1	1,126,390	1,180,049	1,113,283
September 24	1,125,868	1,175,407	1,121,025
September 17	1,127,613	1,179,259	1,098,627
September 10	989,472	1,024,998	975,499
Cumulative total 41 weeks	41,098,446	41,489,117	40,112,263

Car Loading in Canada

Rainy weather seriously affected revenue car loadings at stations in Canada for the week ended October 8, grain loading in the Western division showing a decline of 4,593 cars. The decrease in the total was 523 cars, and, compared with the same week last year, there was a decrease of 1,253 cars.

Commodities	Total for Canada			Cumulative totals to date	
	Oct. 8, 1927	Oct. 1, 1927	Oct. 9, 1926	1927	1926
Grain and grain products ..	16,066	20,237	18,041	291,337	302,551
Live stock	3,633	2,882	2,444	85,761	84,172
Coal	8,630	8,866	9,424	269,483	226,203
Coke	525	478	331	13,201	14,471
Lumber	1,946	3,808	3,644	152,432	146,563
Pulpwood	1,353	1,325	1,785	126,490	109,086
Pulp and paper	2,319	2,325	2,439	88,469	95,642
Other forest products	2,788	3,002	3,004	121,733	123,935
Ore	1,897	2,020	2,111	67,207	69,390
Merchandise, L. C. L.	18,418	18,803	18,190	686,935	652,475
Miscellaneous	17,368	18,680	16,723	593,761	566,166
Total cars loaded	76,883	82,431	78,136	2,496,809	2,390,654
Total cars received from connections	38,331	38,541	38,271	1,509,593	1,493,077

Canadian National Conference On Purchasing Problems

A MEETING unique among railway gatherings was held in Montreal, Quebec, during the week ending September 24 when representatives of the several purchasing offices of the Canadian National Railways joined in a system conference on ways and means of increasing the efficiency of the purchasing department's activities. It has become a general practice in the United States and Canada for railways to conduct meetings among officers and representatives of stores departments for the purpose of securing uniformity in handling and solving the problems of ordering, protecting, distributing and accounting for materials and supplies, but the purchasing department meetings held by the Canadian National are believed to be the only instances where a corresponding recognition has been given to the possibilities of gain through similar discussions of purchasing department work.

This year's meeting is the fourth which has been held on the system and was attended by approximately

In view of the results of the first meeting, it was decided to hold further meetings so that new changes introduced in office procedure could be analyzed and considered in the light of actual performance. The work has now reached the stage where purchase office methods have been stabilized, but in view of the interest taken by the men in these meetings and the continuing results, the belief has been expressed that they will be continued.

This year's meeting was held in the Board of Directors' room of Canadian National under the direction of H. L. Taylor, assistant purchasing agent at Winnipeg, and was conducted distinctly along the lines of a business conference rather than as a convention, those present devoting their entire attention to informal discussions of the various ramifications of the purchasing department work rather than to the presentation of abstract discussions of general principles and policies.

Requisitions, bids, purchase orders, invoices, vouchers, contracts, statistical statements, price records, mailing lists, specifications, sales orders, customs, filing systems and catalogs were among the subjects considered at the meeting. To facilitate discussion and to



Representatives at System Conference at Canadian National Headquarters in Montreal

25 men, principally from Vancouver, B. C.; Winnipeg, Man.; Detroit, Mich.; Toronto, Ont.; Montreal, Que.; Moncton, N. B.; and St. Albans, Vt.

The first meeting was held at Toronto, Ont., in 1923, the year in which the Grand Trunk was combined with the Canadian National lines, as a result of which the present system organization was established with purchasing offices at Detroit, Mich.; Vancouver, B. C.; Winnipeg, Man.; Toronto, Ont.; and Moncton, N. B.; in addition to the general headquarters at Montreal. The purpose of the first meeting, to which assistant purchasing agents, chief clerks and other important clerks in the various offices were called, was to effect such changes in office methods as would tend to simplify the work and improve the office procedure and eliminate lost motion and wasteful clerical effort. With the Canadian National system comprising over 22,000 miles of lines extending from the Atlantic to the Pacific, it was considered desirable to bring the men of the different jurisdictions into personal contact with each other and it was also felt that the men actually in charge of office details could better work out office economies instead of placing the burden of this upon the purchasing agents more or less immersed in other important work.

assure a business-like procedure and the formulation of definite conclusions of practical value, the representatives were carefully picked and given advance information of the subjects to be considered in the form of a schedule which enumerated the topics under which each subject would be discussed. In accordance with this plan, requisitions were discussed point by point under the following topic headings: revision of requisition forms, restriction of sources of requisitions, constitution of requisition numbers, the use of requisition numbers as the order number, the combined requisition and order form, specifications and information on requisitions, number of items and their spacing on requisitions, classification and segregation of requisitions, recording of requisitions, requisitioning in advance of requirement, requisitioning in large quantities, segregating commodities to be requisitioned by one district store only, scheduling classes to be requisitioned periodically and filing.

The bid topics included the revision of tender and tabulation forms, numbering of bids, periodical prices on standard commodities, filing of bids and advising firms of the disposition of bids.

Under purchase orders were discussed the number of

copies, numbering of orders, dating of orders, filing of orders, tracing, use of rubber stamps, copies for headquarters, the question of store department ordering direct, etc., while the consideration of invoices involved a discussion of the standard invoice form, simplified invoice form, number of copies, invoice registering, filing, double-checking, etc. The voucher topics were fan-fold machine for typing vouchers, revision of voucher forms, combined voucher and check forms, payment of vouchers, vouchering by other departments. Consideration was given to the preparation and handling of commodity statements, statements of purchases by firms, monthly statements of office performance, statistical statements, comparative price statements and yearly statements and reports, while price records were investigated to determine to what extent they were maintained and also to consider the uniformity of filing price lists and schedules. The inspection topics were allotment of inspections, inspection reports, distribution and filing. Those for sales orders were limitations on sales, number of departments to be advised, sales orders on returned materials and the sale of obsolete material. Under purchases in general were discussed questions of western stationery firms quoting on eastern system requirements, the necessity of repair list prices being considered when purchasing machinery and equipment, the restriction of purchases made by other departments, and restricting other departments in getting estimates.

A departure was introduced by including in the conference this year two representatives of the store department for the advantages this would afford in expediting the disposition of certain questions involving store department practice and in improving the relations between the two departments. The meeting was addressed by R. C. Vaughan, vice-president in charge of purchases and stores, and by L. Lavoie, general purchasing agent, and it was followed by an inspection of the Canadian National storekeeping methods and facilities at Montreal.

New Haven Runs Grandstands

WHEN the annual Yale-Harvard regatta is held at New London, Conn., in June of each year, the New York, New Haven & Hartford is faced with the problem of operating observation trains, carrying over 4,500 people, back and forth over a busy stretch of track. The problem is complicated by the fact that these trains must be given the right of way over all others. Another difficulty is that the starting time of the races is indefinite and dependent entirely upon wind and tide conditions, so that the schedule of the observation trains is equally indefinite.

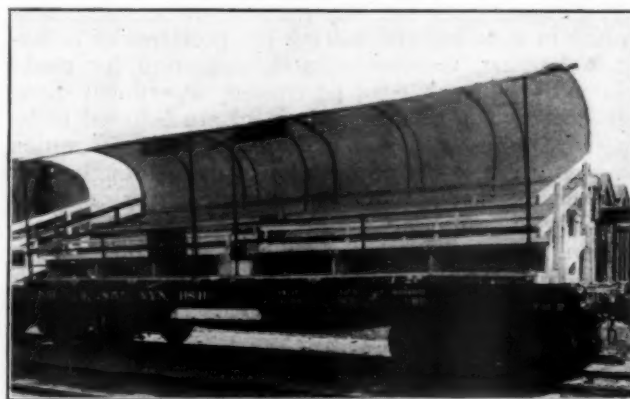
Three races are rowed, the freshman, the junior varsity and the varsity. They are rowed on the Thames river, the first two being two-mile races, finishing one mile above the railway bridge crossing the Thames at New London. A joint train covering both of these races leaves the New London station in advance of the time the freshman race is rowed. After following this race down the river from the starting point, it returns and follows the junior varsity race, continuing back to the station after both races are finished. This year a train of 19 cars, containing about 1,500 passengers, was run for these races.

The varsity race starts from Gales Ferry, four miles above the bridge and finishes directly under the bridge. The train following this race runs parallel with it until it nears the bridge when it is then speeded up so as to

be on the Bridge and over the boats as they finish.

These trains are operated from the New London station for about a mile to a junction just across the bridge over the New York-Boston main line of the New Haven and thence over the Norwich line of the New London division. On normal days, more than 30 passenger trains are operated over this portion of the main line in each direction and this number is increased on the day of the regatta by various special trains into and out of New London from New York, New Haven and Boston. In addition, there are five passenger trains in each direction daily on the Norwich line.

To safeguard the movement of these observation



Type of Car Used in Observation Trains

trains, representatives of the operating department are placed at Gales Ferry, Red Top, Submarine Base, Fairview and Groton Tower, whose duty it is to keep the dispatcher informed of the progress of the trains. In Groton Tower, situated at the junction of the Norwich line and the main line, a detector light is placed and connected with the track circuit for a distance of one-half mile up the branch from the junction point, to give the towerman information when the trains are moving over this section and enable him to protect their movement on the main line accordingly.

Steel underframe flat cars, with specially built superstructures, are used in the train, as shown in the illustration. Four tiers of seats are installed, with the rear tiers elevated as shown, while the passengers are protected by an awning. These cars have a seating capacity of 81 persons each. A detachable ladder is used for loading the cars, which is slung on hooks underneath when not in use. A ticket collector is assigned to each car. The train is spotted for loading on a passing track opposite the station.

The number of spectators at this regatta is steadily increasing, having been over 100,000 this year. With such a large crowd coming in, the station and its surroundings are crowded all during the day and special police protection is required to insure safety. A force of 81 uniformed policemen was employed this year, 10 from the New London division and the remainder recruited from other divisions for the day. These men are on duty at the station, they supervise the loading of the observation trains and a number of them also ride the trains to make sure that some over-excited spectator does not fall off. The supervision of crowds has prevented accidents for a number of years.

After the regatta the cars used in these moving grandstands are turned over to the New York Central for use in the observation train run by that line along the Hudson river near Poughkeepsie, at the time of the intercollegiate regatta, which is held the following week.

Heated Enclosure Makes Work in Winter Possible

Canadian Pacific rebuilds hotel wing in severe weather to avoid construction during vacation season

WINTERS in the Canadian Rockies are severe, but because it would be obviously undesirable to carry on building operations in its Rocky Mountain hotels in the summer time when they are in operation, the Canadian Pacific has sought to enlarge and rebuild its hotels during the winter months in spite

ter and here again the success of this method has been most thoroughly demonstrated. Work which could not possibly have been done during periods of bad weather has been carried on continuously throughout the season in a comfortably heated enclosure, making conditions of employment ideal at a period of the year



West Elevation of the Banff Springs Hotel Showing the Completed New North Wing—Also a View Is Shown in the Lower Scene of the Frame Enclosure Which Makes Winter Work Possible

of the extreme low temperature, heavy snow falls and stormy weather which prevail at that season. The problem was solved in the case of the Lake Louise chalet some years ago by building the permanent structure inside a suitably heated and lighted temporary one. The success attending that operation was such that the same system was followed in connection with the construction of the larger Banff Springs hotel last win-

ter when building construction in such a district had hitherto been practically abandoned.

Was Originally a Frame Structure

The Canadian Pacific's Banff Springs hotel, which is one of the most notable mountain hotels on this continent, was originally built of frame construction but the central portion was replaced some years ago by a stone

structure in order to provide a fire wall and minimize the fire risk. This stone wing is of fire proof construction throughout, and later, following the company's policy in this regard, the north wing of the hotel has been entirely rebuilt in fireproof construction with stone walls. Next winter the south wing will also be rebuilt in the same manner, so that by the opening of the season of 1928 the Banff Springs hotel will be a completely fireproof structure providing 600 bedrooms, bathrooms, spacious dining rooms, lounges, ballroom, conservatory, swimming pool, etc.

The exterior walls are built of native stone in rustic fashion, with raked out joints, the walls being slightly battered all the way up. Buttresses are introduced at intervals on the lower portion, and projecting balustrades at frequent intervals in the upper parts. The window sills, heads, copings, balustrades and general trim are Canadian Tyndall stone from Winnipeg. The large sloping roofs are covered with dull, slightly greenish slate, and the flashings, eaves and downspouts are of copper.

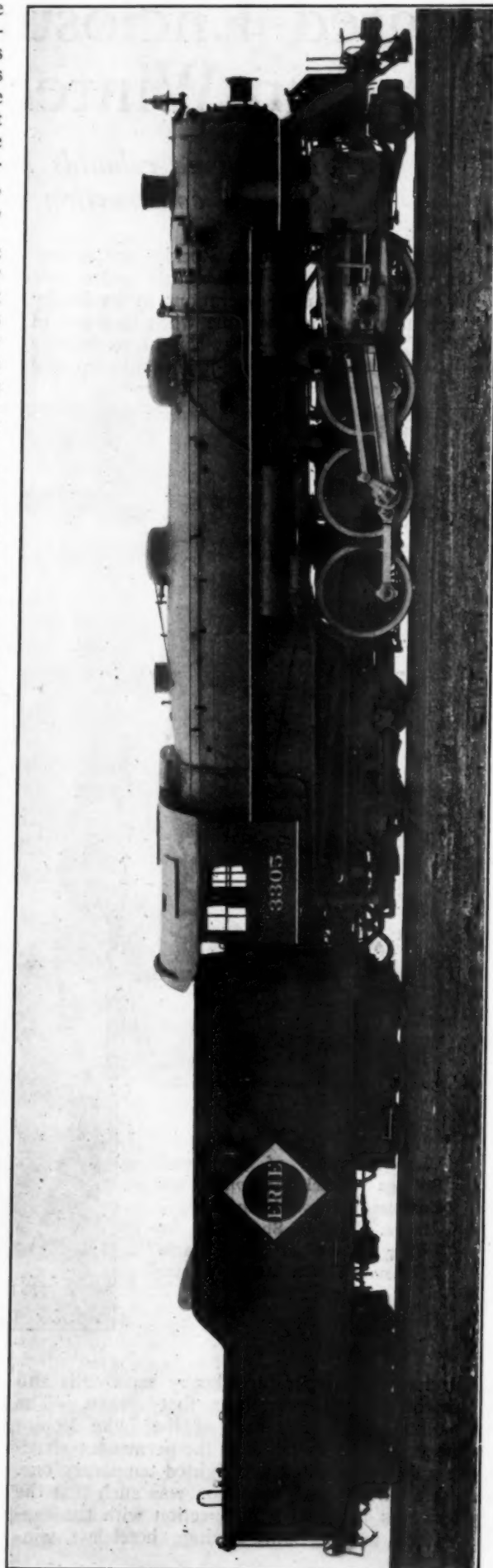
The construction consists of a steel frame, reinforced concrete and tile floors, stone walls and tile partitions. The sloping roofs have a steel frame, with pre-cast gypsum blocks and slate roofing. The floors were of reinforced concrete with T-beams 16 in. center to center, formed between rows of 6-in. hollow tiles 12 in. wide. The concrete on top was floated over to form the finished floor in one operation as the work proceeded. The upper lounge floors are terrazzo, with brass strips, the flower lounge Indiana stone and quarry tile. The main public staircase and interior trim are of Tyndall stone.

The building is on solid rock, and the necessary excavation and concrete foundation for the north wing was done in the winter of 1926. The excavation and foundation for the center tower extension and the building work proper of the north wing and center tower extension were begun on September 16, 1926, and all of the work was completed by April 31, 1927, or a period of 195 working days.

An outside frame structure was erected around the entire wing about five feet away from the building line. This consisted of 2-in. by 8-in. studs 33 in. center to center in the lower panels, and 2-in. by 6-in. higher up. These were capped, strutted and braced to the steel frame at each floor and were sheathed on the outside with common $\frac{7}{8}$ -in. boards and lined inside with a heavy roofing felt. Thus, only one thickness of sheeting separated the new work from the weather. Natural light was obtained by providing openings at different intervals, covered with calico or old sash. The boarding was up as fast as the erection of steel work would permit. Forms for the reinforced concrete floors were also erected right behind the steel workers.

Heating coils and old radiators were installed and connected to the boiler house mains. As the work advanced, this radiation was replaced by the permanent radiators. The frame structure was carried up to the top of the sloping roofs, but where flat roofs occurred the permanent roof formed the top of the shell. Practically all work inside and outside of the building was finished before the enclosure was removed.

The plans were prepared in the office of J. M. R. Fairbairn, chief engineer, under the supervision and direction of J. W. Orrock, engineer of buildings. The contractor was the Carter, Halls, Aldinger Company, Ltd., of Winnipeg, Man., Sam Foxe being the construction superintendent. Basil Gardom, supervisor, western hotel construction for the Canadian Pacific, was in general charge of the work.



One of the 2-8-4 Type Locomotives Recently Delivered to the Erie by the American Locomotive Company

Erie Places 2-8-4 Type Locomotives in Freight Service

*Tractive force, with booster, 81,700 lb. at 80 per cent cut-off
—Weight on drivers 276,000 lb.*

THE twenty-five 2-8-4 type locomotives now being delivered to the Erie by the American Locomotive Company represent the solution of a typical traffic problem. The Erie was faced with the necessity of moving over its main lines, heavier trains at greater speeds. Thus, the locomotives were designed with 70-in. driving wheels for attaining greater speeds than the Mikado and Santa Fe locomotives which the new engines will replace. They are being placed in main line service and operate between Marion, Ohio, and Hornell, N. Y. The western end of the run is over two districts which extend from Marion, Ohio to Meadville, Pa., a distance of 203 miles. The ruling grades eastward are 1.295 per cent between Marion and Kent, and one per cent between Kent and Meadville. Westbound, the grades are one per cent between Meadville and Kent, and 1.315 per cent between Kent and Marion. East of Meadville the ruling grades in both directions, exclusive of pusher grades, are .20 per cent between Meadville, Pa., and Salamanca, N. Y., and .30 per cent between Salamanca and Hornell. In fast freight service some of these locomotives are being tried on continuous runs between Hornell, N. Y., and Marion, Ohio.

The locomotives weigh 443,000 lb. of which 276,000 lb. is on the drivers and 120,000 lb. on the trailing truck. They carry 225 lb. boiler pressure and with a maximum cut-off of 80 per cent, develop a tractive force of 70,000 lb. Including the Franklin booster which drives the rear pair of trailing wheels, the total tractive force is 81,700 lb. The adhesive weight of 276,000 lb. or 69,000 lb. on each driving axle and the 100-in. outside diameter of the boiler at the throat, on a center line 128 in. above the rail, indicate that advantage has been taken of liberal weight and clearance limitations.

Boiler Equipment

To supply steam to the 28½-in. by 32-in. cylinders, a straight top boiler having an inside diameter at the first ring of 90 in. and an outside diameter of 100 in. at the throat is provided. The barrel contains 242 3½-in. flues and 50 2¼-in. tubes 21 ft. long. The Elesco Type E superheater is used, having 112 units. The firebox is 150 in. long by 96¼ in. wide, inside of the sheets, giving a grate area of 100 sq. ft. It is fitted with two Nicholson Thermic syphons and an American brick arch carried on two arch tubes and the syphons. A total of 612 Alco flexible staybolts are used in each boiler, 166 in the throat, 96 in the back head and 350 in the side sheets. Run of mine coal is fed to the grates by Duplex stokers. The grates are operated by a Franklin Type B grate shaker. The total evaporating surface of 5,699 sq. ft. is made up of 960 sq. ft. in the tubes and 4,290 sq. ft. in the flues, 129 sq. ft. in the arch tubes and syphons and 320 sq. ft. in the firebox. The superheating surface is 2,448 sq. ft.

An inside dry pipe conveys the steam from the dome to the Type E superheater header containing the built-in American multiple type throttle. Flexitime steam pipe casings are used to eliminate air leaks into the smokebox.

Superheated steam for the auxiliaries is distributed from a point on the outside of the smokebox, on the left side of the boiler. A description of the piping arrangement for the distribution of the superheated steam to

Railroad	Erie
Type of locomotive	2-8-4
Service	Freight
Cylinders, diameter and stroke	28½ in. by 32 in.
Valve gear, type	Baker
Valves, piston type, size	14 in.
Maximum travel	9 in.
Outside lap	1¾ in.
Lead in full gear	¼
Cut-off in full gear, per cent	80
Weights in working order:	
On drivers	276,000 lb.
On front truck	47,000 lb.
On trailing truck	120,000 lb.
Total engine	443,000 lb.
Tender	310,500 lb.
Wheel bases:	
Driving	18 ft. 3 in.
Rigid	12 ft. 2 in.
Total engine	42 ft.
Total engine and tender	86 ft. 2¼ in.
Wheels, diameter outside tires:	
Driving	70 in.
Front truck	33 in.
Trailing truck	36 in., 43 in.
Journals, diameter and length:	
Driving, main	13 in. by 13 in.
Driving, others	11¼ in. by 13 in.
Front truck	6½ in. by 12 in.
Trailing truck	7 in. by 14 in. and 9 in. by 14 in.
Boiler:	
Type	Straight top
Steam pressure	225 lb.
Fuel	Bituminous
Diameter, first ring, inside	90 in.
Firebox, length and width	150 in. by 96¼ in.
Height mud ring to crown sheet, back	76¼ in.
Height mud ring to crown sheet, front	96¼ in.
Combustion chamber length	None
Tubes, number and diameter	50, 2¼ in.
Flues, number and diameter	242, 3½ in.
Length over tube sheets	21 ft.
Tube spacing	4¼ in.
Flue spacing	3 in.
Grate type	Rocking
Grate area	100.2 sq. ft.
Heating surfaces:	
Firebox and comb. chamber	320 sq. ft.
Arch tubes and syphons	129 sq. ft.
Tubes	960 sq. ft.
Flues	4,290 sq. ft.
Total evaporative	5,699 sq. ft.
Superheating	2,448 sq. ft.
Comb. evaporative and superheating	8,147 sq. ft.
Special equipment:	
Syphons	Two
Superheater	Type E
Feedwater heater	Worthington
Stoker	Duplex
Booster	Franklin
Tender:	
Style	Rectangular
Water capacity	16,500 gal.
Fuel capacity	24 tons
Weight proportions:	
Weight on drivers ÷ total weight engine, per cent	62.2
Weight on drivers ÷ tractive force	3.94
Total weight engine ÷ comb. heat. surface	54.5
Boiler proportions:	
Tractive force ÷ comb. heat. surface	8.6
Tractive force × dia. drivers ÷ comb. heat. surface	601
Firebox heat. surface ÷ grate area	3.20
Firebox heat. surface, per cent of evap. heat. surface	5.62
Superheat. surface, per cent of evap. heat. surface	42.9
Comb. heat. surface ÷ grate area	81.4

the auxiliaries appears on page 670 in the October 8 issue of the *Railway Age*. The article referred to describes the Erie 2-8-4 locomotives built by the Lima Locomotive Works. All parts have been made interchangeable

between the American and Lima locomotives wherever the design permitted. The saturated steam turret is located just outside of the cab. This turret supplies steam to the stoker jet line, grate shaker, Ohio lubricator, tank heater and the Ohio non-lifting injectors.

The Commonwealth Delta four-wheel trailer truck and cradle casting is used in the American Locomotive Company engines. The design of the ashpan is so arranged that the hopper can be removed without dropping the trailer truck. The different type of trailer truck changed the dimensions from the rear driving axle center to the face of the radial buffer. The distance between the trailer truck axle centers on the American engines is 78 in. and on the Lima, 102 in. The distance from the center of the rear trailer truck axle to the face of the radial buffer on the American engines is 94 in. and on the Lima engines 75½ in. The distance from the front edge of the firebox ring to the center of the rear driving axle for the American engines is 40 in. and for the Lima engines is 48 13/16 in. Thus, the boilers on the American built engines were set 8 13/16 in. farther ahead on the driving wheel base.

The main crank pins, which are arranged for internal grease lubrication, and the driving axles are hollow bored 3 in. in diameter. The front pair of driving wheels is fitted with the Alco lateral motion device. Alemite fittings are applied to the reach rod connections and to the valve motion work grease cups.

The flow of steam to the cylinders is controlled by the Baker long travel valve gear designed for 80 per cent maximum cut-off. The locomotives are equipped with the Precision reverse gear.

The Tender

The rectangular tender which has a capacity of 16,500 gal. of water and 24 tons of coal is carried on two Commonwealth six-wheel trucks fitted with clasp brakes. The tender frame is the Commonwealth water bottom type. The engine and tender are finished with Duco. Barco flexible metallic connections are used throughout. The Franklin spring type radial buffer and unit safety draw bar is used between the engine and tender. The principal dimensions and data are in the preceding table.

Rock Island Automatic Train Control Approved

WASHINGTON, D. C.

THE Interstate Commerce Commission on October 18 made public a report by Division 1 approving the installation of the intermittent electric contact automatic train-control device of the Regan Safety Devices Company on the Iowa division of the Chicago, Rock Island & Pacific between Missouri Division Junction, Davenport, and Short Line Junction, Des Moines, a distance of 61.9 miles of double track and 109.9 miles of single track. The installation was completed and placed in operation on July 23, 1927.

The cost of the installation, as reported by the carrier, covering roadside and locomotive equipment, is given as follows:

Roadway Equipment:

Total cost of roadway equipment of train-control installation, less power lines and power apparatus, if any, less cost of signals or cost of change in existing signal system; less salvage	\$ 72,419.15
Total cost of power lines and power apparatus, if any, less salvage	None
Total cost of signal system installed in connection with train control; less salvage	None
Total cost of change in existing signal system made necessary by train control; less salvage	21,018.01

Total all other roadway equipment costs	3,099.82
Total cost of roadway installation	\$96,536.98
Locomotive Equipment:	
Total cost locomotive equipment (48 locomotives) installed	61,982.86
Total cost of installation	\$158,519.84

This section of road was equipped with automatic block signals in 1909, Union, style B and style S semaphores; three-position, upper quadrant. The signals have approach electric lighting in nearly all cases. The description of the automatic control includes the following:

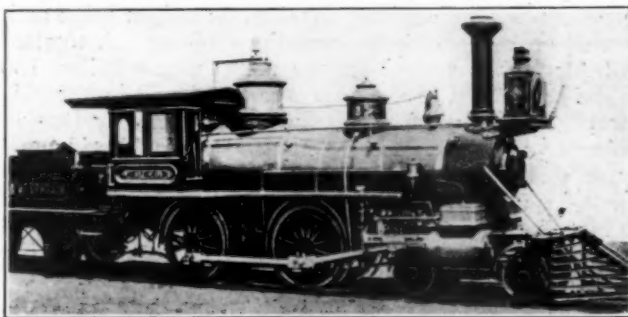
"Main track ramps are Regan standard 60-ft ramps, located at all signals. In addition in single-track territory ramps are located about 3,000 ft. in advance of all signals at entrances to passing sidings. These latter are known as intermediate ramps and, except in a few cases, are wired for three indications, being governed by the indication of the signal in advance. Markers are installed 1,000 ft. from such ramps to indicate approach thereto. Ramps at sidings and cross-overs are 15 ft. long.

"Clearing ramps are permanently energized and are placed so that locomotives leaving train-control territory can enter unequipped territory without speed restriction."

The number of locomotives equipped for this section was 48, as before stated, but passenger locomotives are regularly run through from Chicago to Valley Junction, Ia., over the territory covered by both the first and second orders of the commission, and the total number of locomotives equipped is 145.

The installation is approved without conditions; but the order calls upon the railroad to comply with certain requirements set forth in eight paragraphs, most of which deal with faulty construction or maintenance disclosed by the inspection, or call for additional medium speed restrictions where the installation, as it now stands, provides for only two speeds.

WHERE DO THESE PASSENGERS COME FROM?—The passengers on the several sections of the Twentieth Century Limited of the New York Central, both eastbound and westbound, numbering in all, 569, were questioned, on a certain day recently, as to their home addresses; the train stenographers passing through the train and making inquiry of all those passengers who were readily accessible. Of the total, 211, or 37 per cent, came from Chicago and suburbs and 159, or 28 per cent, from New York City and suburbs. The remaining 35 per cent included representatives from 23 states, California contributing 42 and Massachusetts 25. One passenger was from Canada, five were from England and one from France.



The "James P. Michellon" of the Gloucester & Mt. Ephraim (now Reading)

G. M. & N. Cashes in on Campaigns

Unique methods used to arouse interest and enthusiasm of employees prove highly satisfactory

WHEN the management of the Gulf, Mobile & Northern wants anything done, it conducts campaigns among its employees to obtain the desired result. For example, in 1922, the car performance factors were far from satisfactory. An intensive campaign tending to educating the employees as to car value, and toward increasing the average miles per car per day, was begun. After four years, the result was that the G. M. & N. led a list compiled by the chairman of the car service rules committee, Transportation Division, American Railway Association, showing the ten Class I roads which had made the greatest improvement in car performance factors in 1925, as compared with 1922. The increase during that period amounted to 78.1 per cent. During 1926, still further improvement was made, resulting in a total increase of 110.2 per cent.

A similar campaign in fuel saving resulted in a reduction of 33.3 per cent in the amount of coal consumed per 1,000 gross ton miles during 1926, as compared with 1921. A safety campaign conducted along similar lines aided materially in effecting a reduction in reportable train accidents of 73.4 per cent and a reduction in reportable personal injuries of 57.3 per cent, for 1926 as compared with 1921.

The idea of campaigning for efficiency is not confined to the operating department. A description of the methods used by the employees in soliciting traffic for the railway appeared in the *Railway Age* of August 13, page 291; while a campaign for the prevention of waste of materials and equipment has been carried out successfully for the past three or four years.

The Campaign Methods Used

The campaigns are carried out by personal interviews and by the use of literature. The G. M. & N., while divided into several operating districts, is not separated into divisions. Its operating officers comprise a vice-president and general manager in charge, an assistant general manager, a superintendent of transportation, three trainmasters, two terminal trainmasters and an assistant trainmaster. The assistant general manager averages 7,000 miles of travel on the line every month. Since the total owned and operated mileage of the G. M. & N. is only 733 miles, the number of employees is relatively small and the assistant general manager has an opportunity to converse personally with a large percentage of them every month. On their own districts, the trainmasters also take every opportunity for personal interviews with the men to aid in carrying out the various campaigns.

The literature employed consists of various publications, issued periodically. These are mimeographed on colored paper and illustrated with drawings. Ordinarily this literature is distributed by railway mail, but a complete file of the names and home addresses of the employees in the various departments is maintained so that, if the message is particularly important, it is sent to the employees' homes by United States mail. A more detailed description of this literature is given later.

The success of these campaigns is dependent largely upon the spirit and co-operation shown by the employees. The employees of the G. M. & N. are loyal and practically every one of them is eager to aid his railroad in

every manner possible. At first glance this is rather surprising, since the Gulf, Mobile & Northern was not organized until 1917 and 10 years is a short time in which to develop the morale of employees, particularly when a large part of the time was spent under federal control.

The G. M. & N. had the advantage, in promoting loyalty, of being a comparatively short line. Further, its officers are of the type to inspire loyalty in the men. Loyalty has been made an essential requirement on the G. M. & N. and disloyal employees are not tolerated.

An interesting illustration of this is found in an incident in employee-employer relationships, which occurred recently on this line. Two valuable employees, with years of service to their credit, for reasons of their own or no reason at all, were complaining constantly and apparently attempting to create dissension among the men. All efforts to remedy the situation failed and finally the men were called into the general office. There they were given a two weeks' leave with full pay and expenses and with orders to visit the other railroads in the vicinity and see how working conditions elsewhere compared with those on the G. M. & N. After two weeks the men returned and refused to accept either pay or expenses for the time off, stating that the lesson they had learned was worth far more to them than any payment they might have received. They are now among the most loyal employees and are active in spreading the propaganda that the G. M. & N. is an excellent road to work for.

The management is solicitous of the welfare of its employees and overlooks no opportunity of aiding them if they are in difficulty. The railroad is small enough so that all of the men are known to the officers, as far as their work is concerned, and a good deal is known of their private lives as well, insofar as it affects their efficiency as employees.

In the past few years, several special trains have been run for all sorts of employees when emergencies such as deaths or accidents occurred while the men involved were away from home in the course of the performance of their duties. The road bears expenses of special trains.

The officers have managed to strike the happy medium of straightforward helpfulness, while avoiding an attitude that is too paternalistic, and, inevitably, the employees' loyalty thus gained has been productive of excellent results.

In 1919, the average miles per car per day on the G. M. & N. were 9.9 miles. Immediately after the expiration of federal control, the operating officers set about improving this absurdly low figure, with the result that, for 1926, the average was 43.3 miles, or an increase of 327.2 per cent. This increase has been steadily progressive as follows: 1919, 9.9 miles; 1920, 16.4 miles; 1921, 16.9 miles; 1922, 20.6 miles; 1923, 27.7 miles; 1924, 31.2 miles; 1925, 36.6 miles; 1926, 43.3 miles. This steady improvement has continued in 1927. For the first four months of this year, the average miles per car per day have been 50.4 miles, with a high monthly average in April of 53.4 miles. During 1926, 99.8 per cent of all cars available were delivered before midnight. A very good showing has been made in this particular factor for the past three years, the record having been 95.5 per cent in 1924 and 98.6 per cent in 1925.

A pamphlet entitled "The Box Car" is issued at inter-

vals in furtherance of the car miles campaign. It has the effect of educating the employees as to car mile values, but it is even more valuable in creating a spirit of friendly rivalry. This pamphlet, like the others of its kind issued by the G. M. & N., has a particular appeal because of its informality. Its contents are largely of the small-town newspaper type and it is valuable because of the opportunities afforded for personalities.

When a man has done a good job, he is publicly commended in "The Box Car" and everybody on the railway hears about it. The following excerpts from this publication are typical:

Conductor B. B. Gossett maintained the interest in the movement of cars on main line runs Nos. 90 and 91, which was characteristic of his splendid performances on the Blodgett branch where, during 1926, on 886 separate occasions, he handled a car loaded with one commodity on his outbound trip and brought the same car back to McLain with another commodity on his return trip the same day.

Yard Foreman J. C. Miller, Laurel yard, is a prominent factor in the movement of cars. He has displayed considerable ability and effort in keeping them moving in a correct manner and direction. Innumerable instances which have been brought to the attention of Terminal Trainmaster Swetman, indicate that when it comes to moving cars, Jim Miller is right on the job.

The maintenance of way department is breaking all records loading and unloading company material in quick time, unloading 40 cars of company material in one day on the Laurel district.

Agent Clem Lang at Mobile, and Agent J. L. Lester at Philadelphia, Miss., are always right there playing the game, and they rank high on the list of good car movers.

Conductor Butler on the north end has given up his passenger runs on Nos. 1 and 6, Tennessee division, and taken the Paducah runs in order that he may help move box cars.

Agent Barnett at Montrose is so much interested in the prompt movement of cars that he asked Trainmaster Bridges to furnish him with a small hand cart so that he could truck to his depot warehouse merchandise from cars which consignees had nearly completed unloading, but were likely to be held up on account of the few shipments remaining in the car. Agent Barnett is mighty proud of his new go-cart and is putting it to good use.

Thirty-one dollars per month is a lot of money to pay for a one room unfurnished apartment with two doors and no windows, such as a box car is.

Agent H. L. Smith, Highpoint, Miss., reports G. M. & N. 899 placed by Train No. 96 April 20, loaded and forwarded in No. 97 same day.

All figures pertaining to car movement are also given currently in "The Box Car," together with comparisons of previous records, so that all concerned may see what they are accomplishing.

A Master Car Movers' Association was formed, the election to membership being honorary and only conferred on those who had performed some unusual feat in car movement. This was not confined to the transportation department; maintenance of way men were elected for the prompt unloading of company material and mechanical department men for getting cars repaired promptly. Shippers also were elected, providing they performed some unusual feat in the way of loading or unloading cars promptly. It was not many months before practically everyone on the railway, who was concerned in any way with the movement of cars, had earned a membership to the association. Under the circumstances, with every employee giving enthusiastic co-operation toward the same end, it was inevitable that the campaign be a success.

The results obtained in a similar campaign directed towards fuel saving have also been satisfactory. Coal consumed in freight service in 1921 per 1,000 gross ton-miles amounted to 181 lb.; 1922, 168 lb.; 1923, 168 lb.; 1924, 144 lb.; 1925, 130 lb.; 1926, 121 lb.; a total decrease in coal consumption of 60 lb. per 1,000 gross ton miles, or 33.3 per cent.

Coal consumed per 100 passenger car miles shows an equally satisfactory reduction, having been 2,320 lb. in 1922, 2,310 lb. in 1923; 1,900 lb. in 1924; 1,620 lb. in 1925; and 1,516 lb. in 1926; a total decrease of 804 lb.

per 100 passenger car miles, or 34.6 per cent.

The pamphlet dealing with the fuel campaign is known as "The Fire Box." In this publication, as in "The Box Car," complete, up-to-date performance records are shown, while individual performances in saving fuel receive favorable mention. Following are some excerpts from "The Fire Box."

In through freight service for 1926 Engineer W. S. Boyd, with engine 258 took first place in the year's ranking, with 104 lb. per 1,000 gross ton miles; in so doing he handled 51,325,538 gross ton miles, making 34,146 locomotive miles and consumed 3,186 tons of coal. Fireman A. P. Jones was with him most of the year. However, Firemen J. Moody and V. B. Fagen helped to do it.

Engineer John Ross with Fireman Brown made a very good showing with engine 203 in gravel service, using 107 lb. per 1,000 gross ton miles.

In local freight service Engineer Jim Bura and Fireman H. McDonald took first place with engine 101, making 241 lb. per 1,000 gross ton miles. They handled over 19,000,000 gross ton miles and made 35,000 locomotive miles, consuming 2,362 tons of coal.

Engineer Jack Hildon ran up over last year 13 lb. with engine 60, Fireman John Moody. What's the matter Jack? Isn't John any good?

Engineer H. M. Frese with engine 256 bettered his 1926 January record by 14 lb.—from 143 lb. to 129 lb. That's fine.

Every crew in local freight service made a reduction in the consumption of coal this February as against last February, the biggest reduction being made by Engineer Dahlquest and Fireman Brown on engine No. 106—from 577 lb. to 506 lb.

Two men who do not get much recognition on account of being in the swing are Engineer Billy Beard and Fireman "Jelly Bean" Williams. They run everybody's engines and they are not on long enough to rate, but you will always find them coming and going on time and saving coal.

We want to express appreciation to Fireman Freeman for the arrangement of regular firemen on short passenger runs on the south end. At his suggestion he agreed to take Mobile layover run on Nos. 3 and 4, with engineer Uncle Billy Crawford on engine 32, in order to let Fireman J. B. Gunn go on Nos. 5 and 6 with Engineer E. P. Magee; and Fireman R. L. Stevens took the swing run with Engineer A. M. Tully. This will give regular assignments in passenger service all over the line, thanks to Mr. Freeman.

Prizes are awarded to the three engineers and firemen who make the best showing during the year, usually taking the form of a vacation trip. Last year the winners visited various cities in the East, including Washington, where they met President Coolidge. They also inspected the locomotive plants.

The Safety Campaign

Reportable train accidents on the G. M. & N. amounted to 64 in 1923; 49 in 1924; 26 in 1925; and 17 in 1926; a reduction of 73.4 per cent. Reportable personal injuries were 176 in 1923; 117 in 1924; 108 in 1925; and 75 in 1926; a reduction of 57.3 per cent.

"The Hot Box" is the official publication of the safety campaign. Like the others, it conveys its message by drawings and short paragraphs. Commendation is freely given where it is deserved. A mythical baseball game is written up in major-league style in one of the issues. The box score follows:

ACCIDENTS AND PERSONAL INJURIES

	AB	R	H	E
Heedless, if.....	4	0	0	0
Defective Tool, cf.....	4	0	0	0
Thoughtless, c.....	4	0	1	0
Bad Practice, rf.....	4	0	1	0
Reckless, lb.....	3	0	1	0
Practical Joker, 2.....	3	0	0	1
Violation Rule, ss.....	3	0	1	0
Lazy, 3b.....	3	0	0	0
Careless, p.....	2	0	0	0
Negligence, p.....	1	0	0	0
Can't, p.....	1	0	0	0
Totals	31	0	4	1

GULF, MOBILE & NORTHERN

	AB	R	H	E
Miller, lf.....	6	4	5	0
Carmichael, ss.....	6	3	3	1
Rucker, cf.....	6	4	6	0
Jackson, rf.....	5	3	3	0
McIntosh, lb.....	4	3	3	0
O'Neal, c.....	6	4	5	1

Hoeksema, 3b.....	5	3	4	2
Bridges, 2b.....	6	4	5	0
Campbell, p.....	4	3	3	0
Totals	48	31	37	4
Score by innings:				
A. & P. L.....	0	0	0	0
G. M. & N.....	4	7	1	6

The players mentioned on the G. M. & N. team are supervisory officers and employees who were active during the month in promoting safety.

The following excerpts from "The Hot Box" are typical:

Space reserved for photo of a "Careless Gent" on the G. M. & N. during May, 1926. Photographer was on hand, but the "Gent" did not show up. We didn't want his picture anyway.

We want to congratulate the entire mechanical department forces under General Foreman McIntosh and Car Foreman Lee at Louisville, Miss., for contributing largely to this 100 per cent month. This is not only the first time in our history that we have had a 100 per cent month in both reportable accidents and reportable personal injuries for the entire line in all departments, but it is the first time in history that the mechanical department has had 100 per cent in personal injuries.

George Duck, machinist at Mobile, has never been out on account of personal injury. The best luck we can wish you, George, is that your record continues to grow with you as long as you live.

Engineers Sloan Boyd, J. A. Chapman and Edward Glover sound what we consider a perfect road crossing warning. Jesse Gray also comes in for honorable mention.

Bridge Foremen Joe Aiken and J. L. Grayson talk safety to their men every day, and they are getting results.

Roadmaster A. A. Miller has a perfect record on personal injuries on the Jackson district for the first quarter.

In addition, a page is devoted to safety hints in the employees' timetable.

Other Campaigns

A record sheet is issued each month giving all the records that have been made in the preceding month, also giving all sorts of information, not only as to the results of the campaigns enumerated above, but a variety of other information concerning transportation and traffic not ordinarily made available to employees. One of these sheets includes the following comment:

Each of these records is the result of the efforts of each individual employee; consequently there should be no reason for any employee using an overdue amount of modesty in discussing these records with other employees or with the public.

Campaigning is not confined to employees alone. Letters are issued to shippers in the interest of greater car utilization, requesting their co-operation. That this is being received is indicated by the fact that the average gross tons per freight train during 1926 were 1,272, compared with 1,209 in 1925 and 1,131 in 1924.

One of these letters mailed out recently to all regular shippers on the G. M. & N. contained a statement of the maximum performances of other railways in 11 principal operating factors in 1926, compared with the maximum and the average performances of the G. M. & N. during that year.

The letter continued:

You may wonder just why this information is given you, but I think that it will serve as a basis for evidence that employees of the G. M. & N., even though they are working for a comparatively poor and small but independent railroad, are taking advantage of every possible opportunity to perform the service which alone justifies our existence.

The figures further indicate the splendid spirit of co-operation of our patrons, which should be of some satisfaction to you.

Figures show that we are leading in all of the factors except two, namely net tons per loaded car and net tons per train. Maximum loading cars to capacity by shippers will aid materially in making a better performance in both of those factors, and it is in this direction that your attention is respectfully directed, with assurance that we appreciate, not only your business but the assistance you have given in making your railroad a better one.

A New Steel Hand Truck

THE American Pulley Company, Philadelphia, Pa., has recently developed and put on the market a new type of two-wheel hand truck, made of pressed steel, and designed specifically for heavy service and to overcome the disadvantages inherent in wooden truck construction.

In the makeup of this truck, every part has been designed to give the greatest strength for its weight and the side members are so shaped as to provide a beam, the section of which is greatest where the heaviest load is imposed. The cross pieces between the side members are flanged to make them stronger and more rigid, and likewise, other parts of the truck are made of specially shaped steel members, avoiding the use of flat pieces or ordinary angle iron.

Balance was another factor carefully provided for in



New Type Two-Wheel Steel Hand Truck

the design of this truck because of its importance in the handling of heavy loads. Other features given special attention were the fit of the pressed steel wheels on the bearings, the width of tread, the method of assembly, and the appearance of the truck itself. In the assembly of the new type truck, riveted connections are used throughout, the frame is given a smooth finish, and it is then painted a bright red with tough enamel to protect the metal and to make it possible to locate the truck readily. The only wood used in the construction of the truck is the grips which extend through and are securely riveted within the steel side members.

It is the claim of the manufacturer of these trucks that they are as light as wooden trucks, that loose bolts, splintering and cracking are eliminated, and furthermore, that ready replacement can be made of parts injured by accident.

Railroads Begin Presentation of Testimony in Wage Case

Arbitration board rules that evidence concerning the "ability to pay" is admissible

FORMAL objection by employee counsel to the evidence concerning earnings presented by Charles Donnelly, president of the Northern Pacific, first witness of the carriers, in the hearing at Chicago on the wage increase asked by the Brotherhood of Locomotive Firemen and Enginemen was overruled by the board of arbitration October 14, after a day and a half of argument on the motion by counsel for both sides. The employees concluded their presentation of evidence on October 13, after 15 firemen and hostlers had testified in detail concerning their duties, working conditions, earnings and living conditions.

Hazlett P. Burke, chairman of the board, earlier in the week denied the motion of the employees that they be allowed access to the 1926 payrolls on one division each of the Atchison, Topeka & Santa Fe, the Chicago, Rock Island & Pacific, the Northern Pacific and the Union Pacific. In denying the request Judge Burke declared that "if the railroads in putting in their own case offer evidence vital to the case of the firemen and which the firemen cannot be expected to meet without access to certain records of the roads, the roads will be expected to be ready to furnish access to such records." On October 18 the board denied a further motion by Donald R. Richberg, attorney for the employees, that all of Mr. Donnelly's testimony be stricken from the records.

Mr. Richberg's motion concerning testimony on investment matters objected to all evidence offered on the rate of return, the reasonableness of rates, and other material which might lead to a determination of whether the roads involved in this proceeding are earning a profit satisfactory to their owners. Judge Burke expressed the fear that that type of evidence might unduly prolong the hearing and while overruling the objection he stated that if counsel would not reduce the amount of such testimony it might be necessary for the board to make a further rule curtailing it. Evidence concerning earnings is admissible, he said, and the questions raised by it may become a factor in the final decision of the board.

President Donnelly's Testimony

Mr. Donnelly in his testimony pictured the western railroads as much less able to grant increases in the wages of their employees than the railroads of the East and the Southeast. Since the end of the Federal control period the western lines have had to contend with difficulties greater than and different from anything which lines in other territories have faced, he continued.

"Today the ton-mile rate in Western territory is only 35 per cent in excess of the ton-mile rate of 1915," said Mr. Donnelly, "whereas in the South it is 41 per cent in excess of the ton-mile rate of 1915, and in the East it is 69 per cent in excess. The revenue per passenger-mile in the West is 43 per cent in excess of the 1915 rate, in the East it is 50 per cent and in the South it is 56 per cent. The Northern Pacific passenger revenue in 1919 was \$20,000,000 and in 1926 it was \$12,640,000. It has decreased during the first eight months of 1927 and will undoubtedly be less than in 1926. In 1914,

which as regards passengers carried was the largest year we had without regard to the distance carried, we carried 9,346,000 passengers. In 1926 that number was reduced to 2,806,000. Busses are constantly multiplying and private automobiles are being turned out in large numbers, and each motor vehicle that is put into operation may be said to reduce the number of potential short haul passengers by three or four. We have been utterly unable to reduce passenger train mileage in the same proportion in which passenger earnings have been reduced."

The 18 per cent increase asked would amount to an annual addition of \$440,000 to the Northern Pacific payroll, Mr. Donnelly said. Even as increased in 1927 the wages of other railroads' employees are a less percentage of the 1920 peak wage than is the fireman's wage as it stands today, he continued. If we compare the wages the firemen are receiving today of 95 cents, on the basis of \$1.00 paid in 1920, his purchasing power today, according to authentic statistics of the United States Department of Labor, is the equivalent of \$1.25 in 1920 as regards the cost of living, \$1.40 in terms of retail food prices and \$1.68 in the terms of wholesale food prices. From the standpoint of dividing between the the employer and the employee the gains of industry, the firemen's proportion of the whole is greater now than it has been at any time of which we have authentic records, he continued.

"There is nothing in the condition of our prosperity to warrant the making of a wage award," Mr. Donnelly said. "In 1920 the Great Northern and the Northern Pacific were each paying \$7 annually per share of stock. In 1922 the dividend was reduced to \$5.00 per share. The Chicago & North Western in 1920 paid \$7 per share on common stock and now its dividend is \$4. The Minneapolis, St. Paul & Sault Ste. Marie has discontinued dividend payments since 1920 and the Minneapolis & St. Louis, the Chicago & Alton and the Chicago, Milwaukee & St. Paul are in the hands of receivers. The N. P. and G. N. stockholders are receiving today about 71 per cent of what they received in 1920."

Mr. Richberg in his objection to evidence concerning earnings painted a very black picture of the success of arbitration hearings under the present law, stating that if such material was considered admissible "arbitration of wages on the railroads is at an end, not only in this case but generally. Employees will be forced to arbitrate reasonable transportation rates and reasonable profits when they ask for increased wages."

Ability to Pay

K. F. Burgess, general solicitor of the Chicago, Burlington & Quincy, in opposing the employees objection to "ability to pay" evidence, declared that the demand for an 18 per cent wage increase, if granted, will cost the western railways \$11,500,000 per year.

"If this same percentage of increase is granted to all employees of the Western railroads," continued Mr. Burgess, "the total additional amount which will be

added to our annual payrolls will be \$200,000,000. Such action would consume 45 per cent of the net earnings of the Western carriers and would require, to overcome such loss, a general freight rate increase in excess of 11 per cent.

"The situation of the Western roads is distinctly unfavorable as compared with the Eastern and Southern lines, and as compared with the Western situation before the war. There has been a declining net railway operating income on the Western roads, and, since the return of the railways to private operation, large sums of money have been invested in the Western lines on which there has been no substantial return, although in the East and the South the new money that has been put into those railroads has received a return. These facts indicate the economic conditions in the West as they have been impressed on these railroads by rate regulating authorities. Under these conditions a general cycle of wage increases is against the whole current of economic conditions as they exist in the West. The situation of the Western railroads is so unfavorable as compared with that of the Eastern and Southern lines that it must reflect one of two things: either the Western railroads have been discriminated against, or there are conditions in this territory that have been reflected in rate making and that must likewise be reflected in wage making. Present conditions in the West are such that now is an extraordinarily inappropriate time to start a cycle of general wage increases, particularly when the men who are now demanding increases are receiving wages within five per cent of the peak wages they received in 1920."

Cross-examination of Mr. Donnelly was begun by Mr. Richberg on October 17 in an effort, as he said, to bring out infirmities in Mr. Donnelly's testimony in support of the motion to strike his evidence from the record. Mr. Richberg began by questioning the Northern Pacific investment figure of \$597,000,000 presented in direct examination and declared that for proper cross examination of that statement alone he must ask Mr. Donnelly "literally hundreds of questions." Reports made by the railroads to the Interstate Commerce Commission cannot be introduced by the railroads as evidence in themselves of anything, except that they reported these facts to the government body, he said. Further sessions of the hearing on October 17 and both periods of the hearing on October 18 were devoted to cross examination of Mr. Donnelly. Mr. Richberg devoted his attention largely to examination of the methods used in the determination by the Northern Pacific of the various items making up the total investment figure. If the proper basis were used by the railroads in arriving at an investment figure the rate of return enjoyed by the western railroads would be greater than 5.75 per cent instead of less, as the carriers claim, he said.

Eight New Records for Operating Efficiency

WASHINGTON, D. C.

A COMPARISON of selected items of freight service operating averages of Class I railways for the first seven months of 1927, as compared with the corresponding period of the years since 1920, inclusive, compiled by the Bureau of Statistics of the Interstate Commerce Commission, shows that the best record of the comparative period was established this year in eight of the ten items selected, as to the roads for the United States as a whole.

The average carload, 27.3 tons, had been exceeded in

1920, 1921, and 1923, while the per cent of loaded to total car miles, 63, had been exceeded in all of the years of the period except 1921, when the percentage was only 62.2. As to both these items the best performance was in 1920.

In only four of the items selected, however, did the month of July, 1927, show a better record than July, 1926. These items were gross trainload, gross ton-miles per train-hour, cars per train and pounds of coal per 1,000 gross ton-miles.

The compilation was issued for the roads as a whole and by regions, while a separate statement was issued giving the same comparisons for June and six months for the railways with freight revenue over \$15,000,000 in 1926, individually.

The seven months comparison is as follows:

Comparison of Selected Items of Freight Service Operating Averages, Class I Steam Railways, by Regions

UNITED STATES										
Seven months ended with July	Net ton-miles per mile of road per day	Trainload (tons)		Gross ton-miles per train-hour (ex. locos.)	Net ton-miles per car-day ¹	Average carload (tons)	Car-miles per day ²	Per cent loaded of total	Cars per train (inc. caboose)	Lbs. of coal per 1,000 g.t.m. (inc. locos.) ³
		Gross (ex. locos.)	Net							
1920	5,072	1,417	700	14,690	473	*28.6	23.5	*70.2	35.8	†...
1921	3,888	1,415	643	16,223	375	27.9	21.5	62.2	38.0	164
1922	3,971	1,442	650	16,781	385	26.2	22.4	65.7	38.7	159
1923	5,310	1,518	712	16,305	508	28.2	27.2	66.1	39.2	166
1924	4,761	1,550	696	17,805	451	26.8	25.9	65.0	40.9	154
1925	5,028	1,640	731	19,460	469	26.9	27.0	64.5	43.1	141
1926	5,385	1,699	750	20,414	504	27.0	29.3	63.8	44.6	139
1927	*5,431	*1,761	*773	*21,666	*512	27.3	*29.8	63.0	*46.0	*132
July, 1926	*5,714	1,778	*793	21,769	*535	*27.6	*30.5	*63.5	46.2	121
July, 1927	5,227	*1,798	782	*22,736	493	27.0	29.1	62.8	*47.2	*118
NEW ENGLAND REGION										
1920	3,667	981	449	9,870	251	*24.0	14.3	*73.0	26.6	†...
1921	3,008	1,044	442	12,138	243	22.9	16.1	65.8	30.3	177
1922	2,928	1,073	435	12,292	236	20.1	16.8	70.0	31.9	173
1923	3,756	1,065	460	10,516	250	22.9	15.7	69.6	29.9	197
1924	3,452	1,124	463	12,809	286	21.0	19.6	69.4	32.7	166
1925	3,578	1,198	487	14,010	294	20.6	20.4	69.6	34.9	153
1926	3,766	1,252	504	14,681	308	20.6	21.6	69.3	36.4	147
1927	*3,902	*1,285	*509	*15,776	*321	20.7	*22.9	67.8	*37.3	*137
July, 1926	*3,743	1,288	*522	15,233	*309	*20.8	21.7	*68.3	37.7	129
July, 1927	3,618	*1,301	514	*16,130	308	20.4	*22.3	67.6	*38.2	*122
GREAT LAKES REGION										
1920	9,052	1,700	*849	16,628	427	*28.6	20.8	*71.5	42.5	†...
1921	6,822	1,681	747	19,110	357	26.7	21.6	62.1	46.2	153
1922	6,425	1,652	712	19,565	345	24.0	21.8	66.2	45.9	148
1923	*9,752	1,790	846	18,559	*506	27.9	27.0	67.1	46.2	154
1924	8,177	1,785	785	20,524	450	25.7	27.0	64.8	48.2	145
1925	8,361	1,863	814	22,187	455	25.7	27.4	64.7	50.1	136
1926	8,739	1,887	811	23,022	472	25.4	29.0	64.1	50.9	132
1927	8,802	*1,957	832	*24,436	471	25.5	*29.3	62.9	*52.8	*127
July, 1926	*8,831	1,963	*851	24,244	*480	*25.8	*28.9	*64.1	52.4	114
July, 1927	8,035	*1,972	825	*25,212	436	24.8	27.8	63.3	*53.7	*114
CENTRAL EASTERN REGION										
1920	10,002	1,611	857	14,752	455	33.9	19.6	*68.3	38.0	†...
1921	8,016	1,628	803	16,845	362	*33.9	17.9	59.7	40.6	165
1922	8,012	1,610	784	16,958	353	30.7	17.8	64.6	40.5	162
1923	*11,606	1,729	887	16,088	*515	33.7	23.4	65.4	41.2	168
1924	9,715	1,724	842	17,474	413	31.7	20.5	64.0	42.5	159
1925	10,290	1,809	874	19,298	434	31.7	21.6	63.4	44.5	146
1926	11,142	1,848	887	19,690	473	31.8	23.7	62.6	45.5	147
1927	11,334	*1,936	*926	*21,154	486	32.4	*24.4	61.6	*47.4	*141
July, 1926	*11,552	1,938	940	21,215	*494	*32.1	*24.3	*63.3	47.3	127
July, 1927	10,790	*1,999	*947	*22,516	457	31.6	23.3	62.1	*49.2	*125
POCAHONTAS REGION										
1920	13,500	2,159	1,195	20,854	921	41.3	35.8	*62.2	47.5	†...
1921	11,234	2,158	1,150	22,641	575	42.8	23.9	56.2	48.8	150
1922	13,528	2,274	1,126	23,572	725	42.8	29.5	57.4	50.9	150
1923	14,573	2,244	1,220	22,069	835	42.2	32.6	60.6	48.7	159
1924	14,878	2,257	1,205	21,846	908	42.1	36.7	58.8	49.7	150
1925	17,119	2,437	1,306	27,306	1,006	43.2	40.2	58.0	53.1	128

Looking Backward

Fifty Years Ago

With the sale of the Empire Fast Freight Line to the Pennsylvania on October 17 there now remains only one independent fast freight line—the Merchants' Dispatch—*Chicago Railway Review*, October 20, 1877.

It is stated that the construction of the Glyndon cut-off of the St. Paul & Pacific [now a part of the Great Northern] from Breckenridge, Minn., north 28 miles, just completed, cost including one bridge of 150 ft. and eight small bridges, with main and side tracks ready for rolling stock less than \$6,000 per mile.—*Railway Age*, October 25, 1877.

Among other railway schemes which have appeared with the opening of the extra session of Congress are bills to incorporate the Sioux City, Black Hills & Pacific, to extend from Sioux City, Iowa, westward through Nebraska, Wyoming, Idaho and Oregon to Portland, Ore., and a line from Chicago through Indianapolis, Ind., Lexington, Ky., and Asheville, N. C., to Charleston, S. C.—*Chicago Railway Review*, October 20, 1877.

Twenty-Five Years Ago

The Chicago, Milwaukee & St. Paul and the Union Pacific have concluded a traffic arrangement placing the former road on equal footing with any other line as regards traffic to the Pacific Coast and intermediate territory, a privilege heretofore enjoyed only by the Chicago & North Western.—*Railway Age*, October 24, 1902.

Notwithstanding the immense expenditures which have been made for betterments on railways of the United States in the past 20 years figures gathered from the recent issue of Poor's Manual show that the total capitalization per mile has increased only \$2,000, from \$60,830 in 1882 to \$62,926.—*Railway Age*, October 24, 1902.

The third annual convention of the Railroad Commissioners of Southern States adopted resolutions at Hot Springs, Ark., on October 15, recommending legislation by states to limit the issue of stocks and bonds by railway companies to the actual value of their property and franchises, favoring the abolition of grade crossings and urging Congress to give the Interstate Commerce Commission power to fix rates.—*Railway Age*, October 24, 1902.

L. A. Downs has been appointed roadmaster of the Springfield division of the Illinois Central at Clinton, Ill. A. E. Clift, passenger conductor on the Illinois Central, has been appointed acting trainmaster on the Chicago division at Kankakee, Ill. A. C. Needles, superintendent of the Shenandoah division of the Norfolk & Western, has been appointed superintendent of the Norfolk division, with headquarters at Crewe, Va.—*Railway Age*, October 24, 1902.

Ten Years Ago

H. B. Titcomb, maintenance of way assistant to the chief engineer of the Southern Pacific at San Francisco, Calif., has been appointed superintendent of the Stockton division at Stockton, Calif.—*Railway Review*, October 20, 1917.

In the last 90 days the Pacific Fruit Express has carried 27,000 cars of fruit and other perishables out of California for the East. This average for the three months of 300 cars per day is a volume of this type of traffic which has never before been equaled.—*Railway Age Gazette*, October 19, 1917.

In anticipation of a change of gage from 3 ft. 6 in. to 4 ft. 8½ in., the Imperial Japanese Railways have sent to the United States a special mission consisting of the assistant traffic manager, the secretary and purchasing agent and the director of machinery and rolling stock, to undertake a study of the operation of the transportation machine in this country.—*Railway Review*, October 20, 1917.

Seven months ended with July	Net ton-miles per mile of road per day	Trainload (tons)	Net ton-miles per train-hour (ex. locos.)	Net ton-miles per car-day ¹	Average carload (tons)	Cars-miles per day ¹	Per cent loaded of total	Cars per train (inc. caboose)	Lbs. of coal per 1,000 ft.m. (inc. locos.) ²
1926	19,745	2,641	1,425	30,398	1,192	44.4	46.5	57.7	56.6
1927	*20,348	*2,787	*1,494	*33,086	*1,241	*44.7	*48.6	57.2	*59.5
July, 1926	*22,295	*2,837	*1,552	33,242	*1,300	*45.5	*49.4	*57.9	59.9
July, 1927	19,102	2,833	1,499	*34,969	1,137	44.2	44.9	57.2	*60.2

SOUTHERN REGION

1920	4,009	1,196	559	13,277	508	25.8	27.7	*70.8	31.5
1921	3,169	1,181	513	14,334	397	25.5	24.6	63.1	32.8
1922	3,443	1,234	534	14,796	428	24.6	26.7	65.2	34.3
1923	4,465	1,267	574	14,568	551	*25.9	31.6	67.2	33.9
1924	4,107	1,299	556	15,743	488	24.7	30.3	65.2	35.6
1925	4,431	1,374	585	16,813	509	25.0	31.7	64.3	37.4
1926	*4,850	*1,410	604	17,239	539	25.8	33.1	63.2	38.1
1927	4,699	*1,481	*630	*18,999	*559	25.9	*34.5	62.6	*39.8
July, 1926	*4,726	1,434	608	18,353	*568	25.4	*35.4	*63.2	38.9
July, 1927	4,388	*1,477	*624	*19,596	548	*25.7	34.2	62.4	*40.0

NORTHWESTERN REGION

1920	*3,285	1,307	641	13,955	*453	*26.5	23.6	*72.3	34.4
1921	2,167	1,241	557	14,757	309	25.2	18.8	65.2	34.8
1922	2,434	1,298	587	15,256	349	24.8	20.8	67.7	36.0
1923	3,168	1,374	632	15,506	451	26.4	*26.0	65.5	37.5
1924	2,749	1,414	633	16,526	384	25.1	22.9	66.8	38.7
1925	2,823	1,500	671	18,112	376	25.0	23.8	66.5	41.3
1926	2,916	1,570	683	19,242	418	24.6	25.7	66.1	42.9
1927	2,924	*1,605	*696	*19,853	412	24.8	25.2	65.9	*43.6
July, 1926	*3,320	1,677	*750	21,158	*462	*26.2	*27.5	*64.3	45.5
July, 1927	3,102	*1,705	729	*21,726	425	25.4	26.7	62.9	*46.7

CENTRAL WESTERN REGION

1920	*3,849	1,359	632	15,964	*577	*25.7	31.7	*70.0	35.7
1921	2,863	1,383	595	17,078	455	25.0	28.8	63.2	38.1
1922	2,827	1,396	589	17,598	454	23.5	28.7	67.3	38.2
1923	3,542	1,457	612	17,712	565	24.1	*35.6	65.7	39.5
1924	3,747	1,539	637	19,186	485	23.8	31.0	65.8	41.7
1925	3,405	1,619	658	20,740	477	23.5	30.7	66.1	43.9
1926	3,651	1,704	686	22,259	523	23.4	34.4	65.0	46.1
1927	3,646	*1,732	*692	*22,741	511	23.4	33.8	64.7	*46.8
July, 1926	*4,112	*1,800	*716	23,094	*555	*23.9	*36.7	63.4	*48.3
July, 1927	3,646	1,776	701	*23,488	500	23.2	33.3	*64.8	47.7

SOUTHWESTERN REGION

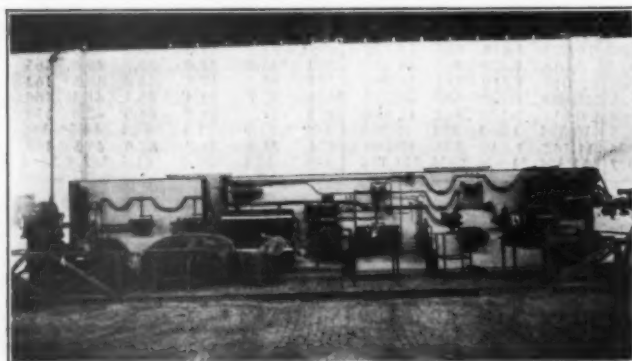
1920	2,743	1,163	535	12,354	402	25.4	22.6	*70.2	31.0
1921	2,327	1,173	507	14,039	365	*25.5	22.7	63.0	32.6
1922	2,198	1,222	527	14,747	362	24.4	22.6	65.9	33.8
1923	2,586	1,260	555	14,500	430	24.7	25.7	67.6	34.1
1924	2,746	1,342	572	16,148	442	24.4	27.7	65.6	36.8
1925	3,067	1,448	604	18,199	489	24.3	31.6	63.9	39.9
1926	3,153	1,513	620	19,625	511	23.9	33.6	63.5	41.7
1927	*3,340	*1,558	*635	*20,271	*533	24.4	*35.0	62.4	*42.6
July, 1926	*3,507	1,561	*672	20,130	*560	*25.5	*34.1	*64.3	41.9
July, 1927	3,265	*1,585	658	*21,437	534	25.1	34.0	62.3	*43.0

¹ Includes unserviceable cars.

² Includes equivalent coal tonnage for fuel oil consumed.

† Data not available.

* Best record of the comparative period.



The Air Brake Exhibit at the Halethorpe Exposition

Communications and Books

Preserve the Halethorpe Collection

LAWRENCE, Mass.

TO THE EDITOR:

As I have been a subscriber to the *Railway Age* for over 12 years and since a very small boy a lover of "iron horses," and have always retained a very keen interest in railroading and railroad officers, I am writing for the purpose of expressing my appreciation of what I saw at Halethorpe, Md. The event I traveled 500 miles to see was "The Fair of the Iron Horse," the Centenary and Pageant of the Baltimore & Ohio.

The greatness of this event first impressed me in New York City where it was widely discussed, but more forcibly upon arriving at Baltimore and seeing the city bedecked with the national colors. Then I realized that the affair was far greater than we had realized here in New England. From the time I arrived until time for the pageant to start I spent in the Hall of Transportation, and what I saw was wonderful beyond words to describe and its educational value was such that every school boy and school girl in the country should have seen it.

The pageant was a revelation. During the two and one-half hours 100 years of vast achievement and the unbelievable changes that have taken place passed before the 75,000 astounded spectators, and its memory is something that will last in the minds of the people that were fortunate in being able to attend. It will, no doubt, be many years before such a marvelous exhibition will again be held.

I have thought what a fine thing it would be if in the city of Washington a Museum of Transportation could be erected where the contents of the Hall of Transportation at Halethorpe and the other historic relics and records of both the railway and waterway development throughout the country could be retained and protected, where the people of the nation could see the great spectacle through the years to come that was seen at Halethorpe last week. I believe that the people of the city of Baltimore, State of Maryland and the nation owe to President Daniel Willard and his hosts of officers and workmen of the Baltimore & Ohio a debt of gratitude for making such a truly wonderful spectacle possible, and I also believe that those who have seen the Fair of the Iron Horse will agree that such an exhibition should be perpetuated and that to the Baltimore & Ohio should go the honor of the leadership in the necessary steps toward its inception.

WARREN G. FANCHER.

A Permanent Railway Museum

VALPARAISO, Ind.

TO THE EDITOR:

On October 5 I was at the Baltimore & Ohio Centennial celebration, "The Fair of the Iron Horse," and was duly impressed by the collection of cars, engines, and miscellaneous paraphernalia too numerous to mention in detail here.

But the chief fact that was brought to my attention was the thought that we do not have in the United States, as far as I know, any permanent exhibition of railway material, historical and educational in its nature, and open free or at a slight fee to the general public.

This summer I had the opportunity, while visiting in Nurnberg, Munich, and Vienna, of seeing the very complete railway exhibits which are a permanent part of the technical museums located in those cities. The exhibit in Nurnberg is, I believe, rated one of the best of the kind in the world.

I believe that the collection which has been gotten together by the Baltimore & Ohio should not be scattered again, but placed under the care of a standing committee of the American Railway Association, pending arrangements for permanently housing it at some central location. The association should create such a committee at once, and each member road could then be solicited to send whatever old material it has on hand which is

possessed of an historic or educational interest, to this committee. If the construction of housing facilities was arranged for, I think that could best be handled through a self-perpetuating board of trustees which should also have power to employ suitable caretakers for the property. The cost of the work could readily be met by contributions from the several railroads who are members of the association, and possibly a slight fee charged for entrance to the exhibits, the revenue from which would go to pay for running the museum.

In other words, the association should foster the creation of a museum on much the same lines as those of other countries, with an exhibit of articles connected intimately with the development of the railroad as a means of transportation in the United States, so that any person could avail himself of the knowledge of past years and could trace the development of any feature from its crude beginnings to its present perfection.

There should also be a complete library of all sorts of railway books, including among other things a complete collection of all the working timetables of all the American railways.

I am convinced that, if properly handled, such a museum and library would become one of the most valuable things of the kind in the world.

WILLARD F. KEENEY, JR.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian,
Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Decisions of Courts and Opinions Affecting Labor 1926. Bulletin of the U. S. Bureau of Labor Statistics No. 444, provided with a detailed table of contents and a cumulative index to these bulletins from 1912-1926 inclusive yearly bulletins of decisions. 311 p. Pub. by U. S. Govt. Print. Off., Washington, D. C., 45 cents.

Posters and Publicity, Fine Printing and Design. Text by John Harrison. A 1927 annual presenting a selection of railroad and travel posters, pages 13-37, from all over the world, while others can be found in the food section and the miscellaneous section. The text comments at length on railway posters. 161 p. Pub. by W. E. Rudge, New York City, and The Studio, Ltd., London, Eng., \$2.50.

Periodical Articles

Commerce Commission vs. Supreme Court—The Issue in the O'Fallon Case, by Barron Mansfield. A review of recent events. *Annalist*, October 14, 1927, p. 577-578.

Congress of the International Railway Union, Stockholm, by John Ball Osborne. Summary of points presented in discussion of passenger traffic, freight traffic and rolling stock interchange, technical matters, warning and danger signals, and automatic brakes and couplings. *Commerce Reports*, October 17, 1927, p. 181.

She's Still the Sarah Jane, by W. H. Blood, Jr. Experiences indicating the difference between theoretical depreciation and what happens actually. *Stone & Webster Journal*, October, 1927, p. 487-491.

Government in Business—Basic Reasons for Its Inefficiency and Failure, by Arthur S. Dewing. A survey of what governments undertake, why, and the results. *Annalist*, September 30, 1927, p. 499-500.

Putting Our Shipping Problem Up to the Railroads. Varied comments on the proposition recently made by Edward N. Hurley, who was chairman of the Shipping Board during the war. *Literary Digest*, October 1, 1927, p. 66, 68.

Odds and Ends of Railroading

An old story that is still good, although hardly applicable to modern railroading, concerns the engineer who complained of the condition of his engine. The master mechanic wired him: "Please advise what you consider necessary to put your engine in good shape," and, so the story goes, received the following reply: "Not much work necessary. Suggest you jack up the whistle and run a new engine under."

The largest housekeeping establishment in the world is the Pullman Company. Included in the items purchased annually are 4,216,946 cakes of toilet soap, 4,527,733 boxes of matches, 103,493,474 drinking cups, 1,876,871 towels, 875,248 sheets, 976,834 pillow slips, 62,692 tidies and 174,081 head-rest covers. More than 712,000 pieces of linen are worn out yearly. Every day is wash-day for this linen and the average daily wash is one million pieces. In all, the company owns 9,711,155 pieces of linen.

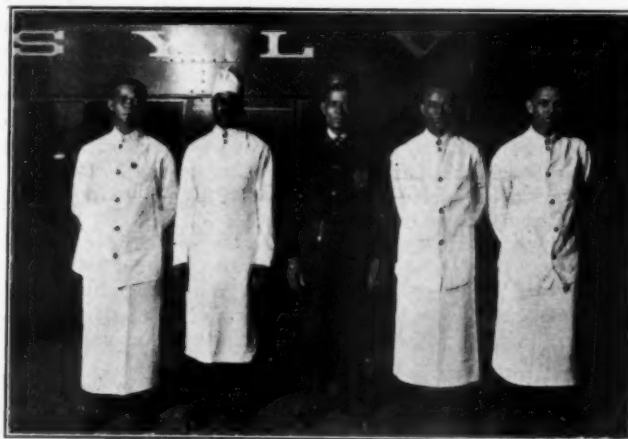
Henry W. Gaines, of Huntington, Long Island, is reputed to be the world's champion commuter. Mr. Gaines recently completed his sixteenth thousand round trip on the Long Island between his home and his law office in New York City. He has used over 600 monthly commutation tickets and has been commuting 73 miles a day for more than 50 years, covering 1,144,348 miles, or the equivalent of 45 trips around the world. The Long Island recently presented Mr. Gaines with a complimentary commutation ticket for one month in recognition of his long service as a Long Island commuter.

Spare time work and the fertile soil of Mississippi yielded one Illinois Central employee a clear return of \$2,000 in less than six months, according to the Illinois Central Magazine. The employee is Louis Lehmann, agent at Hermanville, Miss., and he and his 17-year-old son cleared the \$2,000 by raising slightly more than two acres of tomatoes not far from the station. Mr. Lehmann sold nearly 3,000 crates from his two acres at an average price of 90 cents a crate. His receipts were \$2,684.61 and his expenses \$659.72. The venture occupied only the first half of the year, and a crop of corn is now being raised on the same land.

Three old American favorites, corned beef and cabbage, New England boiled dinner and Irish stew, have staged a comeback. Having withstood repeated invasions of fancy foreign cookery, these three today are among the most popular dishes served on railway dining cars, according to Otto Reiss, supervising chef of the Southern Pacific's commissary service. Once more American tastes stand justified, for Reiss believes this food trinity unsurpassed in any land for taste, wholesomeness and nourishment values. Reiss has sailed for Europe, where he will investigate restaurant and dining car services of European railways, searching for ideas and recipes adaptable for use on American roads. "Our dining car standards are unsurpassed," he said. "But Europe has developed many new ideas since the

war, some of which may be acceptable to American travelers. European chefs produce fine recipes, the best of which are used on our trains. None of these, however, is so lastingly popular as the old-fashioned American favorites."

The Pennsylvania offers another entry in the railway family contest in the five King brothers, who have a combined service record of 43 years, although they are all comparatively young men, as shown in the accompanying illustration. Reading from left to right, the brothers are:



The Five King Brothers, Combined Service Record, 43 Years

Joseph E. King, waiter, New York-Philadelphia run, 10 years' service.
Cecil G. King, second cook, New York-Philadelphia run, 4 years' service.
Reginald H. King, porter, Pennsylvania Station, New York, 17 years' service.

Curtis King, waiter, New York-Philadelphia run, 7 years' service.
Oliver C. King, waiter, New York-Washington run, 5 years' service.

This is claimed to be the record family of colored railway employees.

The Scranton shopmen of the Delaware, Lackawanna & Western have constructed a model locomotive that is in great demand for banquets and meetings of all sorts. It is complete in every detail so far as external appearances go, but it is hollow inside. The locomotive was originally built for a mass meeting of the supervisory officers at Scranton, at which time several small daughters of the officers were concealed in the interior and came forth one by one to dance. Since then it has been used at a number of meetings and has been sent to banquets as far away as New York.



Scranton Shops Apprentice Boys Grouped Around the D. L. & W. Model Locomotive. E. A. Koschinske, Superintendent of Shops, Is at the Extreme Left

NEWS of the WEEK



A Squadron of Electric Locomotives on the New Haven

T. R. DODGE, general secretary-treasurer of the Brotherhood of Railroad Trainmen, died at Cleveland, Ohio, on October 19.

THE NEW ENGLAND RAILROAD CLUB will hold its next meeting on November 8 at the Copley-Plaza hotel, Boston, when a paper will be read on "Car Retarders," by George Hannauer, president of the Boston & Maine.

THE CLEVELAND STEAM RAILWAY CLUB will hold its next meeting on November 7 at the Hotel Hollenden, when a paper will be read on "Interchange Problems," by C. J. Nelson, chief joint interchange inspector, Chicago. There will be a special feature of a moving picture presented, which is entitled "The Car Retarder," by the Union Switch and Signal Company.

A BOARD OF CONCILIATION has been appointed by the Canadian Minister of Labor at Ottawa to mediate in the dispute between the Canadian Pacific Railway and certain employees in the mechanical department of the Angus Shops at Montreal, the employees being members of the Brotherhood of Railway & Steamship Clerks, etc. The men are asking for a wage increase amounting to \$20.40 a month.

A RUMOR that President Coolidge had decided to appoint A. A. Betts of the Arizona Corporation Commission as a member of the Interstate Commerce Commission to succeed Commissioner Hall, who is expected to retire, was officially denied at the White House on October 18. It was stated on behalf of the President that he had no positive information that Commissioner Hall intended to retire, although he had been advised that Mr. Hall's health was not good; and that nothing had been done about choosing a successor. If an appointment is to be made, it was said, because Commissioner Hall is from the mountain region the President would first endeavor to find a qualified man from that region.

Increase for Canadian Enginemen

Locomotive enginemen of the Canadian roads will receive a wage increase of about 5 per cent, retroactive to July 1, as the result of an agreement reached last week

at a conference held in Montreal between the Minister of Labor and representatives of the railroads, and the men. This makes the appointment of a board of conciliation to settle the wage dispute between the two parties unnecessary.

Government Ownership Proposed by Mr. Brookhart

Senator Brookhart, of Iowa, has announced his intention of introducing a bill at the coming session of Congress under which the federal government would acquire control of the railroads by condemnation of their stocks and turn them over to a private corporation with a small capitalization for operation.

Group Insurance for M. P. Shopmen

A group insurance policy, totaling \$16,000,000 of life insurance in addition to an equal amount of accidental death and dismemberment benefits and a substantial volume of accident and sickness weekly indemnity coverage has been arranged by the Missouri Pacific with the Missouri State Life Insurance Company for 9,000 employees in the mechanical department. The plan is co-operative, the railroad paying a portion of the premiums and the individual employee paying the remainder.

President's Cabinet Finds Business Outlook Favorable

In a discussion of reports received by President Coolidge from his Cabinet indicating a favorable business outlook, at the White House on October 18, it was stated on behalf of the President that the prospect of increased purchases of equipment by the railroads is one of the factors to be considered. It was pointed out that by increased efficiency in operation and in the use of cars, as well as because of increased capacity of equipment, the railroads for a time have been able to get along without much new equipment, but that they have now reached the point where additional purchases will be necessary. In connection with a reference to the decrease

in railway passenger traffic, it was stated that the greater use of automobiles by the public is an indication of prosperity, the effects of which are felt in many directions.

Increased Employment

The total number of employees reported by Class I railways as of the middle of the month of July, 1927, was 1,823,335, an increase of 1,845, or 0.1 per cent, over the number reported for the preceding month, according to the monthly summary of railway wage statistics compiled by the Bureau of Statistics of the Interstate Commerce Commission. The total compensation, \$249,314,967, shows a decrease of 0.7 per cent. Compared with the returns for the corresponding month last year, the number of employees reported for July, 1927, shows a decrease of 1.8 per cent, and the total compensation decreased 2.1 per cent.

Fuel Prices

Class I railroads in August paid an average of \$2.66 a ton for coal used as fuel for road locomotives in freight and passenger train service, as compared with \$2.57 a ton paid in August, 1926, according to the Interstate Commerce Commission's monthly statement of railroad fuel statistics. The price ranged from \$1.72 in the Pocahontas district to \$4.44 in the New England district. For the eight months ended with August, the average price was \$2.66, as compared with \$2.61 in the corresponding months of last year. In the eight months the railroads expended \$206,636,267 for coal and fuel oil, as compared with \$209,946,169 in the corresponding period of 1926.

Test Laboratory Inspection

In order to afford all interested an opportunity to inspect the methods of procedure at both the air brake tests and the draft gear tests now being conducted by the American Railway Association, Mechanical division, at Purdue University, Lafayette, Ind., a day, Friday, November 11, has been set aside for general inspection. Unofficial tests will be conducted in the air brake research laboratory under the direc-

(Continued on page 790)

Freight Operating Statistics of Large Steam Roads — Selected Items for August, 1927.

Region, road and year	Average miles of road operated	Train-miles	Locomotive-miles		Car-miles		Ton-miles (thousands)		Average number of locomotives on line daily			
			Principal and helper	Light	Loaded (thousands)	Per cent loaded	Gross, Excluding locomotive and tender	Net, Revenue and non-revenue	Servicable	Un-servicable	Per cent unservicable	Stored
New England Region:												
Boston & Albany.....1927	407	194,644	207,889	21,123	4,990	68.2	255,942	97,651	109	15	12.0	7
.....1926	407	222,267	237,459	26,410	5,076	70.2	258,045	102,670	117	17	12.7	17
Boston & Maine.....1927	2,075	455,794	523,392	50,500	12,452	71.7	625,199	254,748	277	73	20.8	34
.....1926	2,143	455,739	521,363	47,673	12,547	72.2	619,972	257,018	313	90	22.3	42
N. Y., New H. & Hartf.....1927	2,140	580,559	628,448	39,618	16,484	67.7	869,006	360,789	325	67	17.0	57
.....1926	2,162	576,897	603,194	36,737	16,080	68.5	844,911	356,204	318	63	16.5	33
Great Lakes Region:												
Delaware & Hudson.....1927	875	362,291	483,984	49,647	10,529	65.4	667,455	337,544	250	36	12.6	83
.....1926	875	367,392	494,036	52,839	10,478	64.7	665,612	331,823	250	41	14.0	80
Del., Lack. & Western.....1927	999	546,395	615,887	72,771	17,822	68.7	983,498	418,001	251	52	17.2	33
.....1926	999	576,494	665,805	84,071	18,765	70.9	1,049,743	479,214	255	49	16.1	22
Erie (inc. Chic. & Erie).....1927	2,317	987,482	1,080,390	96,104	40,004	64.8	2,409,663	1,022,475	407	160	28.2	17
.....1926	2,323	1,016,040	1,113,091	121,765	39,229	66.2	2,338,196	1,019,257	571	104	15.4	133
Lehigh Valley.....1927	1,345	572,847	626,390	69,754	18,099	65.7	1,078,135	486,040	368	80	17.8	65
.....1926	1,346	598,332	659,563	80,957	19,615	66.5	1,172,230	549,841	397	83	17.3	54
Michigan Central.....1927	1,820	588,672	605,925	21,750	20,056	61.7	1,123,276	412,725	234	65	21.8	57
.....1926	1,835	602,013	619,280	22,289	21,008	62.5	1,145,150	421,950	266	41	13.4	73
New York Central.....1927	6,478	1,933,585	2,152,738	141,823	76,802	62.3	4,712,622	2,051,629	1,124	262	18.9	364
.....1926	6,482	2,023,639	2,286,937	139,772	79,386	63.4	4,839,818	2,144,533	1,203	292	19.5	396
New York, Chic. & St. L.....1927	1,665	603,136	611,189	6,873	20,800	65.0	1,153,157	445,686	237	50	17.4	62
.....1926	1,665	643,885	651,408	6,837	21,138	67.4	1,146,197	455,442	231	48	17.1	47
Pere Marquette.....1927	2,180	459,988	465,774	6,171	12,196	65.0	710,932	309,425	184	41	18.4	9
.....1926	2,179	460,498	467,185	4,944	11,838	64.7	687,460	296,193	187	27	12.6	15
Pitts. & Lake Erie.....1927	231	114,413	116,773	1,320	4,666	64.5	362,396	212,230	59	17	21.8	15
.....1926	231	131,470	133,521	1,313	4,734	66.1	354,833	208,223	66	16	19.6	17
Wabash.....1927	2,497	744,104	779,913	15,029	23,214	65.3	1,324,055	528,918	312	59	15.9	74
.....1926	2,497	741,319	767,102	11,472	24,470	69.6	1,314,497	541,769	319	64	16.8	67
Central Eastern Region:												
Baltimore & Ohio.....1927	5,540	2,124,088	2,490,968	206,289	63,475	61.9	4,317,249	2,114,314	1,053	233	18.1	100
.....1926	5,519	2,101,677	2,428,507	192,380	62,844	62.7	4,138,424	2,009,346	1,058	210	16.6	110
Central of New Jersey.....1927	691	275,257	305,910	34,922	8,088	57.9	537,946	250,107	180	35	16.2	23
.....1926	691	268,526	298,718	36,622	8,168	59.8	541,621	261,659	219	43	16.3	43
Chicago & Eastern Ill.....1927	945	276,952	288,401	4,117	7,345	64.9	447,406	208,394	123	42	25.3	46
.....1926	945	260,520	260,770	4,156	7,675	62.9	458,101	205,231	130	39	23.3	50
Clev., Cin., Chic. & St. L.....1927	2,374	776,008	811,570	23,590	25,131	62.4	1,648,366	789,968	331	110	25.0	43
.....1926	2,374	773,461	816,122	22,516	25,776	62.2	1,671,640	791,946	343	82	19.3	38
Elgin, Joliet & Eastern.....1927	461	138,916	145,031	4,779	3,962	64.5	296,632	157,702	80	12	13.3	5
.....1926	460	131,443	138,866	5,341	3,895	65.4	298,149	158,033	78	15	16.1	2
Long Island.....1927	396	49,203	53,452	12,661	675	58.1	43,058	16,916	48	9	15.4	3
.....1926	393	46,377	51,355	12,902	683	57.3	43,359	17,067	43	13	23.4	...
Pennsylvania System.....1927	10,843	4,389,837	4,844,071	386,076	138,817	64.2	9,080,716	4,259,517	2,893	373	11.4	732
.....1926	10,883	4,879,980	5,335,461	407,223	147,208	64.6	9,775,976	4,719,261	2,710	507	15.8	360
Reading.....1927	1,131	624,935	675,356	64,240	16,683	59.7	1,177,079	587,191	319	74	18.9	55
.....1926	1,129	610,801	667,681	67,600	17,010	61.7	1,165,790	595,231	355	69	16.2	77
Pocahontas Region:												
Chesapeake & Ohio.....1927	2,702	1,289,241	1,403,487	57,672	43,370	55.4	3,544,073	1,909,053	543	95	14.9	24
.....1926	2,650	1,270,357	1,343,108	45,838	42,816	56.9	3,468,436	1,893,198	539	105	16.3	29
Norfolk & Western.....1927	2,232	887,215	1,073,726	36,965	32,074	59.3	2,676,978	1,449,467	558	54	8.8	147
.....1926	2,231	957,843	1,170,519	50,718	34,437	60.1	2,847,080	1,588,199	576	52	8.3	115
Southern Region:												
Atlantic Coast Line.....1927	5,097	630,599	637,838	9,085	15,537	62.8	866,647	341,156	427	56	11.7	114
.....1926	4,931	749,317	759,648	11,668	18,256	59.5	1,086,519	433,810	438	51	10.4	87
Central of Georgia.....1927	1,898	270,192	273,317	6,038	6,990	72.2	366,972	157,314	140	24	14.6	15
.....1926	1,905	362,664	367,708	7,742	8,246	67.4	470,074	208,149	155	18	10.5	3
I. C. (Inc. Y. & M. V.).....1927	6,555	2,057,698	2,081,673	49,566	56,464	63.0	3,658,897	1,597,339	792	94	10.7	16
.....1926	6,555	1,945,812	1,962,634	46,688	56,210	64.0	3,538,953	1,537,434	755	100	11.7	17
Louisville & Nashville.....1927	5,048	1,802,490	1,880,795	65,592	38,274	58.8	2,710,406	1,322,960	637	94	12.8	31
.....1926	5,021	1,772,036	1,855,098	59,158	36,873	59.7	2,550,821	1,244,215	589	115	16.3	13
Seaboard Air Line.....1927	4,295	490,771	497,567	5,310	11,971	64.4	672,241	272,832	237	52	18.1	39
.....1926	3,904	542,104	555,450	6,737	13,677	61.2	801,566	324,791	263	32	10.8	29
Southern Railway System.....1927	8,021	1,895,274	1,923,400	33,788	48,845	65.5	2,715,635	1,109,055	1,080	142	11.6	115
.....1926	8,050	2,180,817	2,216,849	38,205	53,244	64.1	3,019,426	1,227,167	1,082	162	13.0	33
Northwestern Region:												
Chic. & North Western.....1927	8,463	1,542,472	1,608,847	30,311	39,503	62.8	2,364,068	926,454	753	135	15.2	75
.....1926	8,457	1,545,619	1,594,218	26,751	39,798	62.1	2,376,162	994,962	763	150	16.4	126
Chic., Milw. & St. P.....1927	11,202	1,773,854	1,894,460	120,164	52,834	64.1	3,116,338	1,334,645	800	146	15.4	135
.....1926	11,178	1,685,752	1,785,766	97,136	50,741	64.2	2,925,772	1,250,396	859	174	16.8	190
Chic., St. P., Minn. & Om.....1927	1,724	343,554	369,491	15,007	7,642	70.6	423,957	188,395	168	30	15.1	20
.....1926	1,724	311,544	337,319	12,656	6,489	69.7	345,984	147,082	170	29	14.7	2
Great Northern.....1927	8,164	860,348	888,818	56,318	32,635	61.8	2,057,659	962,896	522	164	23.9	99
.....1926	8,138	892,462	923,964	56,153	34,424	60.3	2,222,690	1,043,439	558	156	21.8	111
M., St. P. & S. Ste. M.....1927	4,372	547,828	568,076	7,667	14,866	67.4	818,912	374,838	285	35	11.1	8
.....1926	4,372	520,727	536,952	5,697	13,704	68.1	732,908	328,916	302	36	10.5	21
Northern Pacific.....1927	6,486	905,773	970,613	53,537	27,869	66.5	1,669,049	666,907	470	143	23.3	57
.....1926	6,510	930,790	986,625	56,693	31,625	66.5	1,794,817	746,893	501	137	21.5	67
Oreg.-Wash. R. R. & Nav.....1927	2,154	230,353	241,981	18,711	6,837	69.3	408,480	189,877	136	13	8.5	10
.....1926	2,161	239,227	257,330	27,114	7,176	70.5	422,115	196,299	143	23	13.8	7
Central Western Region:												
Atch., Top. & S. Fe.....1927	10,404	1,770,528	1,910,576	107,621	58,788	63.2	3,532,102	1,251,330	785	152	16.3	154
.....1926	10,244	1,953,243	2,091,829	110,395	61,990	59.8	3,892,528	1,401,668	810	147	15.4	99
Chicago & Alton.....1927	995	305										

Compared with August, 1926, for Roads with Annual Operating Revenues Above \$25,000,000

Region, road and year	Average number of freight cars on line daily			Per cent un- servic- able	Gross ton- miles per train, ex- cluding locomotive and tender	Gross tons per train, excluding locomotive and tender	Net tons per train	Net tons per loaded car	Net ton- miles per car-day	Car miles per car-day	Net ton- miles per mile of road per day	Pounds of coal per 1,000 gross ton-miles including locomotive and tender	Locomotive miles per locomotive day	
	Home	Foreign	Total											
New England Region:														
Boston & Albany.....1927	3,094	4,758	7,852	3.3	17,960	1,315	502	19.6	401	30.0	7,739	161	59.5	
1926	2,410	5,213	7,623	5.9	14,959	1,161	462	20.2	434	30.6	8,139	167	63.3	
Boston & Maine.....1927	13,838	11,577	25,415	7.1	14,837	1,372	559	20.5	323	22.0	3,960	113	52.9	
1926	13,307	13,754	27,061	7.4	14,451	1,360	564	20.5	306	20.7	3,868	125	45.5	
N. Y., New H. & Hartf...1927	22,154	17,063	39,217	15.0	18,821	1,497	621	21.9	297	20.0	5,439	113	55.0	
1926	20,569	20,654	41,223	19.4	18,130	1,465	617	22.2	279	18.4	5,316	118	54.2	
Great Lakes Region:														
Delaware & Hudson.....1927	8,495	5,704	14,199	4.6	22,800	1,842	932	32.1	767	36.6	12,442	137	60.3	
1926	8,336	6,364	14,700	5.8	22,057	1,812	903	31.7	728	35.5	12,230	148	60.6	
Del., Lack. & Western...1927	16,911	7,657	24,568	4.3	21,669	1,800	765	23.5	549	34.1	13,493	128	73.2	
1926	14,930	8,692	23,622	4.8	21,938	1,821	831	25.5	654	36.1	15,469	125	79.7	
Erie (inc. Chic. & Erie)...1927	33,520	20,122	53,642	5.4	27,845	2,440	1,035	25.6	615	37.1	14,234	121	66.9	
1926	33,369	20,507	53,876	8.2	27,099	2,301	1,003	26.0	610	35.5	14,155	114	59.0	
Lehigh Valley1927	22,325	8,856	31,181	10.9	25,072	1,882	848	26.9	503	28.5	11,654	137	50.2	
1926	21,107	10,050	31,157	6.1	25,514	1,959	919	28.0	569	30.5	13,182	138	49.8	
Michigan Central1927	15,811	15,261	31,072	5.2	27,930	1,908	701	20.6	428	33.7	7,317	102	67.7	
1926	14,080	17,260	31,340	5.0	26,648	1,902	701	20.1	434	34.6	7,418	103	67.3	
New York Central.....1927	69,370	69,754	139,124	4.4	29,756	2,437	1,061	26.7	476	28.6	10,216	97	53.4	
1926	62,572	73,936	136,508	3.6	28,371	2,392	1,060	27.0	507	29.6	10,672	103	52.4	
New York, Chic. & St. L.1927	13,518	11,328	24,846	6.0	25,662	1,912	739	21.4	579	41.5	8,635	97	69.4	
1926	11,953	11,261	23,214	7.4	23,941	1,780	707	21.5	633	43.6	8,824	100	76.4	
Pere Marquette1927	9,198	9,471	18,669	4.2	18,861	1,545	673	25.4	535	32.4	4,578	96	67.7	
1926	9,572	11,436	21,008	3.6	17,397	1,493	643	25.0	455	28.1	4,385	101	71.1	
Pitts. & Lake Erie.....1927	13,203	7,614	20,817	3.9	34,739	3,167	1,855	45.5	329	11.2	29,578	85	50.3	
1926	12,476	9,424	21,900	6.6	28,606	2,699	1,584	44.0	307	10.6	29,020	100	53.2	
Wabash1927	16,199	12,258	28,457	2.7	27,904	1,779	711	22.8	600	40.3	6,833	103	69.1	
1926	14,089	12,013	26,102	2.9	25,808	1,773	731	22.1	670	43.5	6,999	109	65.6	
Central Eastern Region:														
Baltimore & Ohio.....1927	73,188	34,917	108,105	5.8	21,281	2,033	995	33.3	631	30.6	12,312	139	67.7	
1926	67,192	38,006	105,198	4.1	20,308	1,969	956	32.0	616	30.7	11,744	148	66.7	
Central of New Jersey...1927	18,771	10,778	29,549	5.0	19,317	1,954	909	30.9	273	15.2	11,678	149	51.0	
1926	18,083	11,965	30,048	5.2	18,515	2,017	974	32.0	281	14.7	12,217	138	41.3	
Chicago & Eastern Ill...1927	13,934	4,803	18,737	26.5	22,392	1,615	752	28.4	359	19.5	7,113	134	57.2	
1926	12,828	5,381	18,209	21.3	22,768	1,758	788	26.7	364	21.6	7,005	116	50.6	
Clev., Cin., Chic. & St. L.1927	19,646	21,276	40,922	5.6	26,467	2,124	1,018	31.4	623	31.8	10,735	109	61.1	
1926	16,170	22,367	38,537	6.8	26,745	2,161	1,024	30.7	663	34.7	10,761	108	63.7	
Elgin, Joliet & Eastern...1927	8,931	6,993	15,924	5.6	14,679	2,135	1,135	39.8	319	12.4	11,035	122	52.5	
1926	9,046	7,318	16,364	6.1	15,143	2,268	1,202	40.6	312	11.7	11,083	120	50.0	
Long Island1927	1,707	4,917	6,624	1.4	5,003	875	344	25.1	82	5.7	1,379	263	37.3	
1926	1,999	6,125	8,124	0.9	5,306	935	368	25.0	68	4.7	1,400	208	36.7	
Pennsylvania System....1927	215,451	83,269	298,720	5.9	23,000	2,069	970	30.7	460	23.4	12,672	117	51.6	
1926	205,438	92,226	297,664	10.2	21,471	2,003	967	32.1	511	24.7	13,988	119	57.6	
Reading1927	26,149	12,006	38,155	2.9	20,954	1,884	940	35.2	496	23.6	16,744	127	60.7	
1926	25,586	14,623	40,209	3.1	20,837	1,909	975	35.0	478	22.1	17,005	143	56.0	
Pocahontas Region:														
Chesapeake & Ohio.....1927	27,991	16,641	44,632	3.1	26,318	2,749	1,481	44.0	1,380	56.5	22,789	90	73.9	
1926	31,614	12,092	43,706	2.9	29,581	2,730	1,490	44.2	1,397	55.5	23,044	89	69.5	
Norfolk & Western.....1927	27,918	9,309	37,227	1.6	39,567	3,017	1,634	45.2	1,256	46.9	20,952	123	58.5	
1926	30,664	10,585	41,249	1.6	37,449	2,972	1,658	46.1	1,242	44.8	22,960	130	62.7	
Southern Region:														
Atlantic Coast Line.....1927	22,428	7,055	29,483	5.9	17,674	1,374	541	22.0	373	27.1	2,159	111	43.2	
1926	20,405	11,000	31,405	4.1	18,693	1,450	579	23.8	446	31.5	2,838	110	50.9	
Central of Georgia.....1927	4,469	5,763	10,232	3.4	18,126	1,358	582	22.5	496	30.5	2,674	129	54.9	
1926	5,023	7,298	12,321	6.9	17,214	1,296	574	25.2	545	32.0	3,525	143	70.0	
I. C. (Inc. Y. & M. V.)...1927	40,832	26,965	67,797	7.5	23,229	1,778	776	28.3	760	42.6	7,861	116	77.6	
1926	39,683	27,459	67,142	4.4	23,101	1,819	790	27.4	739	42.2	7,566	117	75.8	
Louisville & Nashville...1927	41,485	19,285	60,770	11.3	17,554	1,504	734	34.6	702	34.5	8,453	138	86.0	
1926	43,148	18,890	62,038	12.7	17,011	1,439	702	33.7	647	32.1	7,993	145	87.8	
Seaboard Air Line.....1927	15,233	7,342	22,575	6.4	16,941	1,370	556	22.8	390	26.6	2,049	134	56.1	
1926	12,841	8,561	21,402	2.4	17,308	1,479	599	23.7	490	33.7	2,683	127	61.5	
Southern Railway System.1927	56,536	24,802	81,338	5.9	19,438	1,433	585	22.7	440	29.6	4,460	141	51.6	
1926	52,753	27,418	80,171	5.3	18,085	1,385	563	23.0	494	33.4	4,918	148	58.5	
Northwestern Region:														
Chic. & North Western...1927	48,540	32,080	80,620	7.9	18,997	1,533	601	23.5	371	25.2	3,531	117	59.5	
1926	48,539	28,573	77,112	7.3	19,347	1,537	644	25.0	416	26.8	3,795	120	57.3	
Chic., Milw. & St. P....1927	54,636	29,671	84,307	5.6	22,276	1,757	752	25.3	511	31.5	3,843	122	68.7	
1926	53,985	23,903	77,888	6.7	21,564	1,736	742	24.6	518	32.7	3,608	122	58.8	
Chic., St. P., Minn. & Om.1927	2,946	9,429	12,375	9.8	15,414	1,234	548	24.7	491	28.2	3,526	110	62.8	
1926	3,092	8,052	11,144	12.2	14,345	1,111	475	22.8	428	27.0	2,770	122	56.8	
Great Northern1927	42,694	17,337	60,031	6.0	28,250	2,392	1,119	29.5	517	28.4	3,804	109	44.4	
1926	42,844	14,804	57,648	7.0	29,129	2,491	1,169	30.3	584	31.9	4,136	108	44.3	
M., St. P. & S. Ste. M...1927	21,257	7,969	29,226	4.0	17,629	1,495	684	25.2	418	24.6	2,768	95	58.0	
1926	20,410	6,882	27,292	5.4	16,379	1,407	632	24.0	389	23.8	2,427	101	51.9	
Northern Pacific1927	38,707	10,074	48,781	7.1	23,829	1,843	736	23.9	44					

News of the Week

(Continued from page 787)

tion of H. A. Johnson, director of research, and in the draft gear test laboratory under the direction of Dean A. A. Potter, Professor G. A. Young and Professor C. A. Gray, who, with their associates, will conduct visitors through the laboratories and explain all matters in question. Members of the Mechanical division and others will thus be given an excellent chance to familiarize themselves with the work being done to develop improvements in freight train brakes and draft gears.

Test Laboratory Inspection

In order to afford all interested an opportunity to inspect the methods of pro-

cedure at both the air brake tests and the draft gear tests now being conducted by the American Railway Association, Mechanical Division, at Purdue University, Lafayette, Ind., Friday, November 11, has been set aside as a day of general inspection. Unofficial tests will be conducted in the Air Brake Research Laboratory under the direction of H. A. Johnson, director of research, and in the Draft Gear Test Laboratory under the direction of Dean A. A. Potter, Professor G. A. Young and Professor C. A. Gray, who, with their associates, will conduct visitors through the laboratories and explain all matters in question. Members of the mechanical division and others will thus be given an excellent chance to familiarize themselves with the work being done to

develop improvements in freight train brakes and draft gears.

Killed at Highway Crossings in New York

The number of persons killed at highway crossings on the railroads of the state of New York in the year ending June 30 was 147, which is exactly the same number that was reported for the year preceding. This and other facts are given in a special report which has been made by Charles R. Vanneman, chief engineer of the Public Service Commission. Mr. Vanneman says that of the total number of grade-crossing accidents in the year under review, 746, nearly one-half occurred at crossings at which there were bells, or

Operating Revenues and Operating Expenses of Class I Steam Railways in the United States

Compiled from the Monthly Reports of Revenues and Expenses for 183 Steam Railways, Including 15 Switching and Terminal Companies

Item	United States		Eastern District		Pocahontas Region		Southern Region		Western District	
	1927	1926	1927	1926	1927	1926	1927	1926	1927	1926
Average number of miles operated	238,728.76	237,910.89	59,443.19	59,531.74	5,606.87	5,604.86	39,762.59	39,423.35	133,916.11	133,350.94
Revenues:										
Freight	\$415,178,666	\$429,606,035	\$178,731,092	\$185,805,239	\$22,233,656	\$22,728,861	\$52,219,184	\$54,026,104	\$161,994,734	\$167,045,831
Passenger	91,690,862	99,013,936	48,759,697	51,790,089	1,781,510	1,994,739	10,387,055	12,654,013	30,762,600	32,575,095
Mail	7,653,180	7,613,922	2,926,616	2,896,993	199,060	189,972	1,121,216	1,147,731	3,406,288	3,379,226
Express	11,874,787	11,547,962	5,821,632	5,540,851	289,314	249,847	1,340,934	1,096,248	4,422,907	4,661,016
All other transportation	18,227,215	18,699,092	10,303,821	10,699,926	217,943	306,870	862,356	1,031,299	6,843,095	6,660,997
Incidental	12,032,172	13,051,279	5,758,417	6,241,211	355,390	486,879	1,019,350	1,191,826	4,899,015	5,131,363
Joint facility—Cr.	1,182,414	1,129,837	490,340	455,170	21,848	15,382	139,195	148,014	531,031	511,271
Joint facility—Dr.	403,285	404,804	126,869	128,199	2,525	2,179	42,451	36,347	231,440	238,079
Ry. operating revenues	557,436,011	580,257,259	252,664,746	263,301,280	25,096,196	25,970,371	67,046,839	71,258,888	212,628,230	219,726,720
Expenses:										
Maintenance of way and structures	80,229,224	81,489,169	34,165,860	35,448,756	3,213,811	4,536,219	9,981,227	11,011,610	32,868,326	31,492,584
Maintenance of equipment	102,890,100	108,071,440	48,557,515	51,995,375	4,892,000	4,846,120	13,437,125	14,123,233	36,003,460	37,106,712
Traffic	9,946,366	9,804,776	3,855,888	3,709,736	262,966	266,725	1,663,549	1,689,911	4,163,963	4,138,404
Transportation	180,821,393	182,338,051	85,118,342	85,317,688	6,201,073	6,434,253	23,039,735	24,035,841	66,462,243	66,550,269
Miscellaneous operating	5,106,967	5,062,802	2,238,481	2,266,222	77,904	81,412	430,005	492,184	2,360,577	2,222,984
General	16,086,738	15,298,180	7,394,682	7,011,775	572,899	517,360	2,087,991	2,058,753	6,031,166	5,710,292
Transportation for investment—Cr.	1,786,540	1,641,116	310,790	196,975	58,567	83,665	85,395	301,524	1,331,788	1,058,952
Ry. operating expenses	393,294,248	400,423,302	181,019,978	185,552,577	15,162,086	15,598,424	50,554,237	53,110,008	146,557,947	146,162,293
Net revenue from railway operations	164,141,763	179,833,957	71,644,768	77,748,703	9,934,110	10,371,947	16,492,602	18,148,880	66,070,283	73,564,427
Railway tax accruals	35,934,315	36,654,446	15,776,996	15,849,458	1,813,991	1,966,011	4,451,554	4,663,345	13,891,774	14,175,632
Uncollectible ry. rev's	90,080	108,899	23,724	52,255	7,817	2,620	14,928	14,764	43,611	39,260
Ry. operating income	128,117,368	143,070,612	55,844,048	61,846,990	8,112,302	8,403,316	12,026,120	13,470,771	52,134,898	59,349,535
Equipment rents—Dr. bal.	7,828,787	7,839,617	3,732,857	3,590,784	4,454,856	4,322,617	4,141,720	387,688	4,692,506	4,183,762
Joint facility rent—Dr. balance	2,062,088	2,271,342	1,037,561	1,206,483	90,961	93,051	102,906	120,851	830,660	850,957
Net railway operating income	118,226,493	132,959,653	51,073,630	57,049,723	8,476,197	8,632,882	12,064,934	12,962,232	46,611,732	54,314,816
Ratio of expenses to revenues (per cent)...	70.55	69.01	71.64	70.47	60.42	60.06	75.40	74.53	68.93	66.52
FOR EIGHT MONTHS ENDED WITH AUGUST, 1927 AND 1926										
Average number of miles operated	238,395.69	237,765.16	59,440.68	59,581.05	5,568.03	5,565.77	39,601.91	39,240.50	133,785.07	133,377.84
Revenues:										
Freight	407,932,855	408,031,943	1,355,805,473	1,372,276,040	166,633,451	162,003,835	418,756,273	436,516,261	1,106,737,658	1,113,235,807
Passenger	661,943,605	701,888,284	338,873,164	349,866,701	13,774,714	14,811,201	87,830,872	105,824,817	221,464,855	231,385,565
Mail	62,461,488	62,884,560	23,819,032	23,846,857	1,622,908	1,648,888	9,296,160	9,498,996	27,723,388	27,889,819
Express	88,658,684	92,760,633	41,348,223	43,844,372	2,016,489	2,031,053	11,802,834	12,552,307	33,491,138	34,332,932
All other transportation	136,808,234	138,501,259	77,461,077	79,164,177	1,679,606	1,841,594	7,337,814	8,162,096	50,329,737	49,333,932
Incidental	85,495,724	87,245,666	42,651,774	43,397,161	3,126,545	3,369,690	9,251,487	10,721,112	30,465,918	29,757,703
Joint facility—Cr.	9,239,044	8,736,782	3,700,886	3,517,989	123,561	112,766	1,343,758	1,138,716	4,070,839	3,967,311
Joint facility—Dr.	3,315,818	3,183,033	1,073,182	1,056,147	18,810	17,850	270,714	272,978	1,953,112	1,836,058
Ry. operating revenues	4,089,223,816	4,172,866,094	1,882,586,447	1,914,857,150	188,958,464	185,801,177	545,348,484	584,141,327	1,472,330,421	1,488,066,440
Expenses:										
Maintenance of way and structures	585,045,760	576,070,380	242,343,614	242,540,523	25,877,750	25,344,142	80,472,442	84,055,055	236,351,954	224,130,660
Maintenance of equipment	824,631,143	856,684,058	392,505,531	413,185,098	39,876,272	39,195,441	109,176,890	112,994,100	283,072,450	291,309,419
Traffic	80,494,584	75,657,644	29,769,078	27,567,651	2,106,833	1,982,366	13,959,059	13,544,981	34,659,614	32,562,646
Transportation	1,440,356,155	1,442,017,480	687,231,634	682,587,953	49,287,551	48,987,952	192,442,305	203,282,215	511,394,665	507,159,360
Miscellaneous operating	37,523,701	37,495,292	17,263,123	17,198,543	680,796	734,587	4,231,057	4,654,322	15,348,725	14,907,840
General	128,062,989	123,443,339	58,291,321	56,746,136	4,496,606	4,046,275	16,779,538	16,094,989	48,495,524	46,555,939
Transportation for investment—Cr.	10,191,041	10,469,184	1,824,864	1,261,108	343,065	348,176	989,242	2,021,489	7,033,870	6,838,411
Ry. operating expenses	3,085,923,291	3,100,899,009	1,425,579,437	1,438,564,796	121,982,743	119,942,587	416,072,049	432,604,173	1,122,289,062	1,109,787,453
Net revenue from railway operations	1,003,300,525	1,071,967,085	457,007,010	476,292,354	66,975,721	65,858,590	129,276,435	151,537,154	350,041,359	378,278,987
Railway tax accruals	253,081,951	255,145,894	105,416,374	106,287,652	14,217,225	13,116,195	33,379,509	35,124,732	100,068,843	100,617,315
Uncollectible ry. rev's	981,455	1,063,532	388,025	523,627	36,143	25,709	161,838	128,910	395,449	385,286
Ry. operating income	749,237,119	815,757,659	351,202,611	369,481,075	52,722,353	52,716,686	95,735,088	116,283,512	249,577,067	277,276,386
Equipment rents—Dr. bal.	57,376,354	54,287,388	31,643,752	30,477,795	4,388,191	4,795,061	4,576,044	9,383,057	25,039,749	19,651,597
Joint facility rent—Dr. balance	16,637,232	15,935,775	8,062,584	7,329,140	802,578	761,849	922,895	961,946	6,849,175	6,822,840
Net railway operating income	675,223,533	745,534,496	311,496,275	332,104,140	55,802,966	56,749,898	90,236,149	105,938,509	217,688,143	250,741,949
Ratio of expenses to revenues (per cent)...	75.46	74.31	75.72	75.13	64.56	64.55	76.29	74.06	76.22	74.58

a Includes \$3,716,621 sleeping and parlor car surcharge. b Includes \$4,047,554 sleeping and parlor car surcharge. c Includes \$26,971,362 sleeping and parlor car surcharge. d Deficit or other reverse items. e Includes \$27,865,005 sleeping and parlor car surcharge.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.

lights, or flagmen, or gates; and the proportion was about the same in the year preceding. In 140 cases reported, automobile drivers ran at full speed into the side of passing trains; and cases in which drivers drove through gates with fatal results numbered five. No account has been kept of cases where drivers went through gates without injury to themselves.

B. & O. Exposition Closes

With a total attendance of 1,250,000 during its three weeks and one day of existence, the Baltimore & Ohio's centenary and pageant, "the Fair of the Iron Horse" closed on October 8. Attendance, which averaged about 50,000 daily during the early days, mounted rapidly as the closing date drew near and on the last three days the attendance averaged 100,000.

At the present time the grounds at Halthorpe are in the same condition as during the fair, with the exception that some of the equipment outside the buildings has been removed, as has the grandstand. No definite plans for the future have been made, although it is possible that the Baltimore & Ohio transportation may be rearranged so as to be available to the public. On October 17 the British locomotive "King George V" was attached to a train of seven B. & O. cars, including a dynamometer car, and made the run to Philadelphia, thence to Washington, returning to Baltimore—possibly the first time in history that a locomotive borrowed from an overseas country has been used in this country. Railway officers who traveled on the train reported that the trim British locomotive gave a good account of itself.

Cotton Belt Fifty Years Old

The St. Louis Southwestern on October 1 celebrated the 50th anniversary of the beginning of service on its lines. Daniel Upthegrove, president, presented each employee with a button to mark the date. The letter which accompanied the button read, "This is an emblem which I trust that you will take pride in wearing, for

loyalty is a conspicuous characteristic of those who are connected with this railroad. Please wear this emblem as a visible token of your pride in being a member of the Cotton Belt organization and let it be our constant aim to excel both in efficiency and courtesy. I take this opportunity to thank you individually for your fidelity to the interests of this company and express the hope that you will find happiness in your work."

The St. Louis Southwestern began service between Tyler, Tex., and Big Sandy, 21 miles on October 1, 1877, the company having been incorporated in December, 1871, as the Tyler Tap Railroad Company. The motive power consisted of two diminutive locomotives, "Punch" and "Judy." The northern section of the system had its inception in the Little River & Arkansas Valley Railroad Company, which was organized on September 7, 1876, and which was completed as a three-foot gage line, connecting New Madrid, Mo., and Malden, a distance of 26½ miles, in January, 1878.

On May 17, 1879, the name of the Tyler Tap was changed to the Texas & St. Louis, and in May, 1881, the Texas & St. Louis Railway Company of Arkansas was organized to construct the line from Bird's Point, Mo., to Malden. In July, 1881, the two companies consolidated as the Texas & St. Louis Railway Company, and in 1882 the road was completed from Pine Bluff, Ark., to Gatesville, Tex. In the same year the road was completed from Bird's Point on the Mississippi river to Clarendon, Ark. The bridges across the White and Arkansas rivers were completed and traffic begun between Clarendon and Pine Bluff on August 12, 1883. By an incline at Bird's Point cars were put on floats to be transferred to the Illinois Central at Cairo.

A reorganization was effected as the St. Louis, Arkansas & Texas Railway companies in Missouri, Arkansas and Texas in May, 1886, and in January, 1891, the present names of St. Louis Southwestern Railway Company and St. Louis Southwestern Railway Company of Texas were adopted.

The road in Missouri and Arkansas was changed from narrow to standard gage in December, 1886, while in Texas it was changed in January, 1887. The company later constructed, purchased or leased the branch lines which are now a part of the system.

An incline was built at Gray's Point on the Mississippi river to transfer cars to the Illinois Central at Thebes, Ill., and the line extended to Delta, Mo. This line was opened for traffic in November, 1898. Contracts were made in 1901 for freight and passenger service over the St. Louis, Iron Mountain & Southern tracks into St. Louis. In 1912 a contract was made with the Chicago, Rock Island & Pacific for the use of its line from Brinkley, Ark., to Memphis, Tenn.

Too Much Freight Moving by Truck, Says Hannauer

The industries of New England are diverting from the railroads of New England to motor trucks approximately 4 million tons of freight a year, a large part of which could be better handled by rail, or by a co-ordination of rail and truck, President George Hannauer, of the Boston & Maine, declared on October 19 in an address at the annual meeting of the Associated Industries of Massachusetts.

President Hannauer was addressing the Transportation Conference on the interdependence of New England railroads and New England industries, in the course of which he cited the unprecedented speed of changes that are going on in industry and in transportation alike as reasons for a mutual co-operation between the important industrial and transportation elements in New England's economic life.

New England's railroads, he said, under these conditions are obligated to aid New England industries by "(a) the best possible service, embracing adequate car supply, speedy movement and dependable schedules; (b) the lowest practicable rates consistent with a fair return on the funds invested in the railroads and establishment of sound credit; and, supplementing these



The Great Western's (England) "Cornish Riviera Express" near Teignmont on South Devon Coast

two, (c) a further extension of the attitude and organization by the railroads to help New England industries grow and prosper."

"New England's railroads by the same token must have the support of New England industries: (a) New England industries should see to it that the railroads are advised of the conditions that the industries must meet in order to reach out and to hold competitive markets; (b) New England industry should interest itself in seeing that New England railroads receive fair consideration in matters of taxation, legislation and regulation, and (c) New England railroads should have the support of New England's industries in obtaining for the railroad and its allied services the fullest possible amount of traffic which can be justified under economic considerations. I refer here frankly to goods now moving on trucks, either common carrier, contract or private, which are shipped in many instances without full consideration by the industries of all that is involved, either as to maintaining an adequate rail volume to insure dependable train service and reasonable rates, or in some instances without consideration of the actual out-of-pocket costs.

"The New England railroads in 1926 carried 7.3 per cent less freight originating in New England than they did in 1919. This fact has been advanced as evidence that New England is decadent. The fact is that New England industries between 1919 and 1926 actually increased their activities 9.2 per cent, according to the New England business activity index of the Federal Reserve Bank of Boston, and if this increase is translated into tonnage, New England industries in 1926 used or produced nearly 4 million more tons than they did in 1919.

"Four million tons, then, is the approximate amount of freight which New England industries have diverted from the railroads to the trucks.

"Much of this truck traffic is moving uneconomically,—and if any large part of this 4 million tons of freight a year can be regained by or for the railroads of New England, through better service on our part, through closer co-ordination with motor vehicle service where that is the most efficient and most economic means of transport, or through increased public recognition of the value of according to the railroads increased support by a larger volume of traffic, it will help a lot to enable the railroads of New England to establish even better schedules, and in the end may even have a tendency to ease rates. There is a direct relation between the volume of business and the cost of handling it.

"Let me make clear the fact that much of this business moves more advantageously by truck than by train, because of its small volume, because of the short haul which is involved, or because of its relation to other traffic. The truck, like the automobile, has become a permanent part of the transportation picture, and some railroads, the Boston & Maine among them, are today using the trucks to good advantage under local conditions to which they are especially adapted."

The semi-annual meeting of the Associated Traffic Clubs of America will be held at the Jefferson Hotel, Richmond, Va., on October 25 and 26. Consideration will be given H. R. Bill No. 17390, a bill to repeal section 15 of the Transportation Act; H. R. Bill No. 17403, a bill which is a redraft of the Parker Railroad Consolidation bills and the Hoch-Smith resolution.

Twenty miles an hour, instead of 30, has been made the speed limit for trains descending the steep grade of the Pennsylvania Railroad near Gallitzin, Pa., where occurred the derailment of passenger train No. 28, on an eight degree curve, on August 29, last. This report, from Harrisburg, Pa., indicates that the reduction of the speed limit has been made at the request of the State Public Service Commission, following its investigation of the derailment referred to.

The Atlantic Coast Line and the Seaboard Air Line have filed with the Interstate Commerce Commission a statement of their objections to putting into effect the basis of freight rates to and from points in the peninsular of Florida proposed by the Commission in its report on the Southern Class Rate Investigation. They say they can accept no responsibility for the plan for making rates to and from the Florida peninsular prescribed in the report and that it would result in serious, if not disastrous decreases in the revenues of the Florida carriers. They urge the maintenance of the basis that has been in effect, which uses separate factors of the through rates to cover that portion of the through movement which takes place south of the Florida gateways.

The Interstate Commerce Commission has assigned the lake cargo coal rate cases, involving the relation of coal rates from the different fields to the lakes for transshipment, for hearing at Washington on November 16 and Minneapolis on November 29 before Commissioners Campbell and McManamy and Examiners Koch and McGrath. Evidence will be received first in Investigation and Suspension Docket No. 2975, in which the commission suspended proposed increased rates on coal from mines on the Buffalo, Rochester & Pittsburgh and the Reynoldsville & Falls Creek to Cleveland, to be followed by the presentation of evidence in I and S Docket No. 2967, in which the commission suspended the 20-cent reduction in rates from Kentucky, Tennessee, Virginia and West Virginia proposed by the roads serving those fields to meet the reduction ordered by the commission from Ohio and Pennsylvania.

Two Thousands Tons by Airplane

The Ford Motor Company, according to a dispatch from Detroit, has, in 28½ months, carried on its airplanes 4,000,000 lb. of freight; and also 16,000 lb. of mail.

Traffic

The Ford air line between Detroit and Chicago began operations on April 13, 1925; Detroit and Cleveland on July 1, of the same year; and Detroit and Buffalo on March 28 in 1927.

Record Day's Traffic Through Panama Canal

Thirty-three commercial vessels, having an aggregate net tonnage of 143,196, transited the canal on October 1, 1927. Combined tolls on the day's traffic totaled \$136,861.31, not including tolls of \$0.75 on a launch. In point of number of commercial transits and tolls collected, this establishes new high records for one day's traffic through the Canal. The previous high record was established December 29, 1926, with 29 transits, and the previous high record for tolls was made May 25, 1923, when \$136,604 was collected.

Shower Baths in Boston Station

Toilet rooms which include shower baths, and with ample space for changing clothes, are being provided at the South Station, Boston, on a large scale; and the announcement in the newspapers suggests that such facilities might well be availed of by passengers coming in on sleeping cars, rather than to put up with the inconveniences which, on crowded cars, sometimes interfere with comfortable dressing.

The new facilities (for men) are on the floor below the main concourse and there are 38 rooms, large and small. Similar accommodations are being prepared for women.

Southern Grain Rates to Be Investigated

The Interstate Commerce Commission has announced a broadening of the scope of proceedings now pending involving freight rates on grain and grain products from northern and western grain producing regions and from Mississippi and Ohio river crossings to destinations in southern territory, responding to numerous requests; and will include the subject in its pending proceeding No. 17,000, the rate structure investigation. It is not the intention of the commission to go into the question of what constitute reasonable transit rules and regulations. This portion of the general investigation is designated No. 17,000, Part 7, Grain and Grain Products, (A) Southern Territory Rates.

Reduction in California Fruit Rates Again Postponed

The Interstate Commerce Commission has again postponed the effective date of its order reducing rates on deciduous fruits from California to eastern points, this time to December 10. On petition of the railroads for a postponement and a reconsideration, particularly of the interpretation

of the Hoch-Smith resolution on which the order was based, the commission recently postponed the effective date from October 10 to November 10, but said nothing as to whether it would reconsider the case. Later the Great Northern and other northern transcontinental lines asked for a further hearing in the case if the order was intended to apply to rates via north Pacific coast gateways and the commission has modified the order to show that rates via such gateways are excepted.

Says Alberta Coal Transportation Costs Figured Too High

Premier J. E. Brownlee of the province of Alberta has issued a statement to the effect that the Dominion Railway Board in its judgment regarding the haulage of Alberta coal eastward to Ontario was guilty of various errors in computation. Premier Brownlee states that as a result of some of these errors the rate has been made 47 cents higher than actual facts of the case call for.

Briefly, the effect of the error, which comes through figuring an average load for a car at from 2.8 to four tons lower than figures from both the Canadian National and Canadian Pacific show, means that Alberta is entitled to a rate of at least \$6.75 per ton, instead of the board's finding, \$7.22 per ton, the statement says.

In its judgment the Railway Board undertook to accept as its basis of average loading the figures resultant from test shipments of coal from Alberta to Ontario, and Premier Brownlee asserts these test shipments were made in trains composed of nothing but minimum capacity cars, arranged for to ensure the speediest distribution to as many different points as possible.

New York and Pennsylvania Grape Growers Ask Rate Reduction

Grape growers' associations of New York and Pennsylvania have filed a complaint with the Interstate Commerce Commission asking reductions in freight rates on grapes, in carloads, from their vineyards to the principal producing markets, which are now based on the second-class rating in the Official Classification. They assert that the rates are unreasonable, discriminatory in relation to the rates from California to the same destinations, which the commission recently ordered reduced, and also "contrary to the true policy of rate-making" laid down in the Hoch-Smith resolution. They say that a depression exists in the industry; that under the present rates "shipments may not freely move," and that they are "higher than the lowest possible lawful rates compatible with the maintenance of adequate transportation service."

In a separate opinion in connection with the commission's recent reduction of the California rates, Commissioner Eastman said that it was "very probable that an even stronger case for reductions in fruit rates can be made throughout the eastern territory"; and Commissioner McManamy, dissenting, referred to the New York rates.

Pennsylvania Opens New Perishable Freight Terminal

The Pennsylvania Railroad announces that it now has the largest water-front terminal for perishable freight in the world; the rebuilt piers 27, 28 and 29, North River, New York City. These piers have been one of the principal freight terminals of the road in New York for more than 50 years, but now are to be devoted wholly to fresh fruits, fresh vegetables and dairy products. Two thousand or more shippers, fruit merchants and others have been invited to a luncheon at the dedication of the new terminal on Saturday, October 22.

These three piers are each 900 ft. long by 72 ft. wide, and the intervening bulkheads are 230 ft. by 300 ft. Water-tight concrete floors have been laid on all the piers and all are enclosed and fitted with heating apparatus, said to constitute the largest single enclosed artificially heated space in the world.

The total floor space is now nearly 400,000 sq. ft., sufficient to display the contents of 700 cars of fruit at one time. There are eight auction rooms and a completely equipped restaurant. The company, in conjunction with the reconstruction work of the past year, has also made extensive additions to its Manhattan produce yard in Jersey City.

Freight Traffic in August

The freight traffic handled by Class I railroads in August amounted to 41,973,291,000 net ton-miles, according to compilations by the Bureau of Railway Economics. This was a decrease of 1,760,720,000 net ton-miles or 4 per cent under that of August, 1926. All districts reported decreases, the Eastern and Southern districts each showing a decrease of 4.1 per cent and the Western district 5.9 per cent.

For the first eight months in 1927, the volume of freight was the greatest for any corresponding period ever reported, amounting to 314,332,715,000 net ton-miles. This was an increase of 1,747,735,000 net ton-miles, or six-tenths of one per cent, above that of the corresponding period last year. Railroads in the Eastern district for the eight months reported an increase of nine-tenths of one per cent, while the Southern district reported a decrease of 1.9 per cent. The Western district reported an increase of one per cent.

The average daily movement per freight car for the first eight months in 1927 was 30 miles, the highest mark ever attained in any corresponding period, and an increase of four-tenths of one mile above the best previous average, established in the first eight months of 1926. The average movement in August was 30.9 miles, as compared with 31.5 miles in August last year.

The average load per car for the first eight months in 1927 was 27.3 tons, an increase of one-fifth ton above the average for the first eight months in 1926. The average for August was 27.6 tons, compared with 27.9 tons in August of last year.

Foreign

Improvement in Financial Condition of Belgian Railroads

The financial situation of the Belgian railroads under corporate management shows continued progress, and, in place of being a burden to the Belgian government, as they were when operated as a state enterprise, they have become an increasing source of income from the investment the government holds in the Société National de Chemins de Fer Belge, according to advices received from Acting Commercial Attache Leigh W. Hunt at Brussels.

Receipts for the second quarter of 1927 amounted to 728,500,000 francs, compared to expenditures of 617,200,000 francs, showing an excess of 111,300,000 francs receipts. The excess of receipts over provisions during this period amounted to 47,300,000 francs. For the first ten months of activity of the Société National, that is, from September 1, 1926, to June 30, 1927, the financial situation shows the following results: Receipts, 2,325,200,000 francs; expenditures, 1,896,900,000 francs; excess of receipts over expenditures, 428,300,000 francs.

On the side of expenditures considerable economies are being made, largely due to reduction of personnel. Experiments have also been carried out in the economizing of coal, and various locomotives of different types have been equipped with superheaters which realize a 20 per cent saving in coal consumption.

The DETROIT & IRONTON has been granted by the Interstate Commerce Commission a further extension of time to December 31, 1929, for the completion of the line from Malinta, Ohio, to Durban, Mich., under the certificate issued by the commission on August 1, 1924. The company had asked for an extension to 1931.



On the L. & N. in Alabama

Supply Trade

H. D. Conkey & Company, Mendota, Ill., has appointed **W. C. Minnier**, of Cleveland, Ohio, and **Chatard & Norris**, of Baltimore, Ohio, to be its representatives.

The **Graybar Electric Company**, New York, has opened two new distributing houses, one at Flint, Mich., with **H. W. Tinch** as sales manager, and the other at Rochester, N. Y., with **J. A. Royce** as sales manager.

J. R. Matlack, treasurer of **S. F. Bowser & Company**, Ft. Wayne, Ind., has been appointed treasurer and general manager of the **S. F. Bowser & Company, Ltd.**, Toronto, Ont., and will be succeeded by **E. D. Eggimann**, the secretary.

H. S. Peck, supervisor of locomotive and power plant operation of the Chicago, Milwaukee & St. Paul, with headquarters at Chicago, has been appointed sales representative of the **Edison Storage Battery Company**, with headquarters at the same point.

Jack L. Jacobson has been appointed representative in the New York territory of the **Reading Iron Company**, Reading, Pa. He will assist **H. S. Carland**, district sales representative at New York. Mr. Jacobson was formerly associated with the **Barrett Company**, of Chicago, Ill.

Obituary

Kurt C. Barth, director of the research division of the Western Red Cedar Association, died on October 9 at Evanston, Ill., after a short illness.

Harris C. Macklin, until about a year ago sales agent of the **Railway Steel Spring Company** and the **Southern Brass Works**, at Norfolk, Va., and formerly for about eight years, previous to 1913, purchasing agent of the **Seaboard Air Line**, died suddenly on October 8, at the age of 71.

Edwin Stevens Allen, president of the **National Railway Publication Company**, New York, and manager of the **Official Railway Guide**, died suddenly of heart disease on October 18 at his home in South Orange, N. J., at the age of 67. Mr. Allen was born in Bordentown, N. J. and graduated from Princeton University in the class of 1881. Throughout his business career he had been associated with publishing. He was also vice-president and a director of the **American Railway Supply Company** and also a director of the **Railway Equipment and Publication Company**.

Trade Publications

1-4 CONCRETE INSERTS.—The **Midwest Steel & Supply Company**, Bradford, Pa., has issued a folder illustrating and describing its 1-4 concrete inserts, designed for use in reinforced concrete building construction to afford a firm fixture in walls, columns or ceilings, to which shelf angles, or the many and various types of hangers, may be affixed with adjustability.

SMOOTH FINISH MACHINING OF LOW CARBON PLAIN AND ALLOY STEELS.—This is a reprint of a paper from the Transactions of the American Society for Steel Treating which is being distributed by the **International Nickel Company**, New York. It is a practical explanation of correct shop practice for obtaining a smooth finish on plain and alloy steels by avoiding the critical range in volume removal rates which varies for different steels.

DU PONT HISTORY AND DEVELOPMENT.—**E. I. du Pont de Nemours & Co.**, Wilmington, Del., has published an attractive anniversary number of its **Du Pont** magazine. Within this issue, which contains 48 pages, are to be found a large number of interesting facts about the history, development and growth of the company during the past 125 years. It also points out the intimate relationship existing between the apparently wholly unrelated products manufactured by the company.

THE LOADS ON CULVERT PIPES.—In a bulletin of 20 pages, issued by the **Armco Culvert Manufacturers' Association**, facts now available concerning the loads imposed on culverts buried in embankments are presented and discussed. The data given include those obtained in various tests, such as those made at Iowa State College, the University of North Carolina and the Farina tests sponsored by the A. R. E. A. These are discussed from the standpoint of the behavior of the flexible type of culvert which develops lateral resistance through the widening of the horizontal diameter. The bulletin is also illustrated with views of Armco culvert installations.

BONANZA CEMENTILE ROOFING.—The **American Cement Tile Manufacturing Company**, Pittsburgh, Pa., has issued an attractive and informative general catalog dealing with every phase of the three distinct types of Bonanza cementile roofing which it manufactures. Of the 76 pages included in this catalog, the first 40 pages are devoted almost entirely to construction and actual installation views of the various types of cementile roofing, while the remaining 36 pages include specifications, data, and detail sheets, showing the application of cementile roofs to the various types of building construction. In addition to the general catalog, this company has also published a supplementary catalog made up entirely of specifications and detail sheets, which is designed primarily to be of service to engineers, architects, and draftsmen.

The **BALTIMORE & OHIO** has given a contract of 375 tons of steel for a bridge at Cincinnati, Ohio, to the **American Bridge Company**.

Equipment and Supplies

Freight Cars

THE **CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA** is inquiring for 500 hopper car bodies.

THE **UNITED STATES SMELTING & REFINING Co.** is inquiring for from 12 to 16 general service cars of 70 tons' capacity.

H. W. TAYLOR, Hagerstown, Md., has ordered 4, 30 cu. yd. air dump cars, from the **Koppel Industrial Car & Equipment Co.**

THE **CENTRAL ALLOY STEEL COMPANY**, Masillon, Ohio, has ordered 1, 30 cu. yd. air dump car, from the **Koppel Industrial Car & Equipment Co.**

Passenger Cars

THE **NEWFOUNDLAND RAILWAY** is inquiring for one combination sleeping and observation car and two sleeping cars.

Iron and Steel

THE **GRAND TRUNK** is reported to be inquiring for 10,000 tons of rail.

THE **LONG ISLAND** is inquiring for 100 tons of steel for a bridge at Long Beach, N. Y.

THE **CHESAPEAKE & OHIO** is inquiring for 5,500 tons of steel for a viaduct at Cincinnati.

THE **CANADIAN NATIONAL RAILWAYS** have ordered 50,000 tons of rail from the **Algoma Steel Company**.

THE **BOSTON & MAINE** has ordered 100 tons of steel for a bridge at Concord, Mass., from the **Boston Bridge Works**.

THE **GREAT NORTHERN** has ordered 2,300 tons of structural steel for bridge work from the **American Bridge Company**.

THE **PENNSYLVANIA** has ordered 100 tons of steel from the **McClintic-Marshall Company** for a bridge at Lansdowne, Pa.

Machinery and Tools

THE **ILLINOIS CENTRAL** is inquiring for one 10-ton electric crane for use at Paducah, Ky.

THE **NEW YORK CENTRAL** has ordered a two spindle flue sheet and mud ring drill, from the **Niles-Bement-Pond Company**.

THE **CHICAGO, MILWAUKEE & ST. PAUL** is inquiring for one 25-ton freight handling gantry crane for use at St. Paul, Minn.

THE **NORTHERN PACIFIC** has ordered a No. 3a universal Pratt & Whitney die sinker, from the **Niles-Bement-Pond Company**.

Construction

CHICAGO & NORTH WESTERN.—A contract for the construction of a hollow tile passenger station at Lombard, Ill., has been let to S. G. Cool, Chicago, at a cost of about \$15,000.

GRAND TRUNK WESTERN.—A contract has been let to W. E. Lennane for the construction of a grade separation structure at Joseph Campau avenue, Hamtramck, Mich. The cost of this project is estimated at \$230,000, while improvement to track facilities coincident with this construction are expected to make the total cost \$340,000.

GREAT NORTHERN.—A contract for the construction of a passenger station at Whitefish, Mont., has been let to the T. B. Butler Construction Company, Seattle, Wash., at a cost of about \$60,000. Outside dimensions of the building are 36 ft. by 155 ft.

GREAT NORTHERN.—A contract has been let to E. J. Dunnigan, St. Paul, Minn., for the construction of water treating plants at 24 points on its lines in western North Dakota and eastern Montana at an estimated cost of \$300,000. These water softening plants will be constructed at Bismarck, N. D., Mandan, Sims, Glen Ellen, Richardton, Dickinson, Belfield, Medora and Beach, and at Wibaux, Mont., Heckman, Glendive, Conlin, Benz, Miles City, Joppa, Forsyth, Sanders, Custer, Pampeys, Pillar, Huntley, Billings and Laurel.

LONG ISLAND.—The grade crossing elimination program planned for various points on the line of this road to last through several years until 1931 has been set ahead, and, according to plans now being considered, about 25 crossing eliminations will take place within the coming year.

NEW YORK CENTRAL.—A contract has been let to the Jobson-Gifford Company of New York for the reconstruction of a bridge at Niagara Falls, N. Y. A contract has been let to Edward J. Duffy Company, Inc., of Weehawken, N. J., for the construction of a platform, canopies and driveways, together with drainage, between 140th and West 146th streets, New York. The Interstate Electric Construction Corporation, of Springfield, Mass., has been awarded a contract for electric wiring and the installation of lighting systems in the engine house and yard at Harmon, N. Y. Almirall & Co., Inc., of New York, has been let a contract for piping for a generator at Glenwood, N. Y. A contract has been let to Wright & Kremers, Inc., of Niagara Falls, N. Y., for the construction of a freight house, canopies and platforms at North Tonawanda, N. Y. Another contract has been let to the Walsh Construction Company, of Syracuse, N. Y., for exterior piping for shop facilities at Harmon, N. Y. The National Boiler Washing Company of Illinois, at Chicago, Ill., has been let a contract for piping between the annex

building and engine house and the power house, at Harmon, N. Y., and the Chipewa Plumbing Company, of Buffalo, N. Y., has been awarded a contract for piping in the power house at Buffalo.

NEW YORK CENTRAL.—Plans are being considered by this road for extending its four-track line from Manitou, N. Y., a distance of about 10 miles, to Beacon, all in Putnam county, New York.

PENNSYLVANIA.—This road has awarded a contract to A. N. Spooner & Sons, Inc., of New York, for extending tail track trestle in the yard at Greenville, N. J. It has awarded contracts to the T. J. Foley Company of Pittsburgh for the reconstruction of an overhead highway bridge at Robbinsville, N. J., to cost \$25,000, and for the construction of an overhead highway bridge to eliminate five grade crossings at Fernwood, Pa., to cost about \$80,000. It has given a contract to the Automatic Sprinkler Corporation of America for the installation of a sprinkler system on Pier K, Jersey City, at a cost of \$52,000.

TENNESSEE CENTRAL.—An order for a junior "N. W." type electrically operated cinder conveyor to be installed by company forces at Monterey, Tenn., has been given to the Roberts and Schaefer Company, Chicago. This project will include the construction of two inspection pits.

TEXAS & PACIFIC.—A contract has been let to the Austin Brothers Construction Company, Austin, Tex., for the construction of a steel shop building at Big Spring, Tex., to replace a building destroyed by fire. Outside dimensions of the shop will be 42 ft. by 146 ft. with an addition of 14 ft. by 62 ft.

WESTERN PACIFIC.—This company, through its president, H. M. Adams, has presented to the Idaho Public Utilities Commission plans for the construction of a connection between the Western Pacific and the Union Pacific at Wells, Nev., about 6,000 ft. in length. Included in this project, which is expected to involve a total expenditure of \$160,000, is the separation of the grades of two highways by the construction of subways at the point where the new line of the Western Pacific would cross the Southern Pacific. The crossing of the Southern Pacific would be effected by means of a 120-ft. overhead steel span.

New Line Planned in South Dakota

The South Dakota State Railway Commission, having held a hearing in relation to the convenience and necessity of a proposed new line of railway from Mound City, in Campbell county, to Leola, in McPherson county, South Dakota, has filed a transcript of the hearing with the Interstate Commerce Commission and their recommendation that the permission be granted for the construction of such line. The promoters of the line say they are ready to begin active construction work as soon as the project is approved by the Interstate Commerce Commission.

Financial

CANADIAN NORTHERN.—Debt Redemption.—A meeting of holders of the Canadian Northern 5 per cent income charge debentures has been called at Montreal by officers of the Canadian National for November 15, when it is expected acceptance will be given to the offer of the latter railway for redemption of the former's stock. The meeting will also be held in London, Eng., and proxies have been mailed to holders of the debentures there. With the proxies was an outline of the plan of arrangement that has been suggested and a recommendation to the stockholders by the Dominion Securities Corporation, Ltd., and Wood Gundy & Company, Ltd., in favor of acceptance. The committee in London representing the stockholders has already accepted the plan of settlement, as well as the trustees for the stockholders in Great Britain, the British Empire Trust Company, Ltd. The amount of these debentures outstanding is approximately \$25,000,000 and no interest has been paid upon them since 1914. The debentures become payable, at par, in May, 1930, but, under the plan suggested, they are to be retired in May, 1928, at 94 per cent. When the arrangement arrived at between the stockholders' committee and the management of the railway has been ratified by the holders of the securities, the plan will await the endorsement of the Dominion Parliament.

DELAWARE, LACKAWANNA & WESTERN.—Bonds.—This company has applied to the Interstate Commerce Commission for authority to assume obligation as guarantor in respect of \$9,871,000 of first refunding 3½ per cent bonds of the Morris & Essex and to sell the bonds at not less than 83½.

GERMAN STATE RAILWAYS.—Proposal to Sell Securities in America.—It is reported that the Deutsche Reichsbahn Gesellschaft, which is operating the German railways under the conditions of the Dawes plan, plans to issue 200,000,000 marks of 7 per cent preferred stock, a part of which would be offered in the New York market. Under the plan reported no actual stock would be brought to this country, but that it would be held in trust and trust receipts issued to be listed on the stock exchange.

ILLINOIS CENTRAL.—Abandonment.—This company and the Mississippi Valley Company have filed with the Interstate Commerce Commission a joint application for authority to abandon a line from Brookhaven, Miss., to Monticello, 20 miles, which was originally constructed to serve saw-mill operations which have now been abandoned.

INTERNATIONAL-GREAT NORTHERN.—Bonds.—The Interstate Commerce Commission has authorized this company to procure the authentication and delivery of \$1,575,000 first mortgage 5 per cent bonds, series B, to be pledged from time to time as col-

lateral security for short-term notes. The company's petition was for an amount of \$2,090,000.

LAKE SUPERIOR & ISHPEMING.—Stock Issue Approved.—The Interstate Commerce Commission has approved an issue of \$2,856,000 capital stock to be issued by this company as a dividend of two shares of common stock for each share of common stock now outstanding. The company is controlled by ownership of 75.2 per cent of its capital stock by the Cleveland-Cliffs Iron Company. It was a consolidation in 1923 of the Lake Superior & Ishpeming and the Munising, Marquette & Southeastern. Since the consolidation the company has paid dividends of 5, 22½, 20 and 50 per cent, respectively, in the years 1923 to 1926.

LOUISVILLE & NASHVILLE.—Acquisition of Line.—The Interstate Commerce Commission has issued a certificate authorizing the acquisition of the railroad line owned by the Kentenia-Catron Corporation in Harlan County, Ky. The line serves coal operations which produced approximately 900,000 tons of coal in 1926. The purchase price is \$100,000, to be financed out of current funds.

MINNEAPOLIS & ST. LOUIS.—Receiver's Certificates.—The Interstate Commerce Commission has approved the issue of \$500,000 receiver's certificates to renew or extend certificates of like amount maturing in October and November, 1927.

NEW YORK CENTRAL.—Valuation Argument.—The Interstate Commerce Commission has assigned the oral argument on the protest against its tentative valuation report for November 30 at Washington.

PENNSYLVANIA.—Valuation Argument.—The Interstate Commerce Commission has assigned the oral argument on the protest against the tentative valuation reports covering properties of the Pennsylvania system for November 28 and 29 before the Commission.

SEABOARD AIR LINE.—Assumption of Obligation.—The Interstate Commerce Commission has authorized this company to assume obligation and liability as guarantor with respect to \$925,000 Baltimore Steam Packet Company 5 per cent gold notes, issued to cover the purchase of a new steamer.

SOUTHERN PACIFIC.—Abandonment of Branch.—The Interstate Commerce Commission has issued a certificate authorizing the Central Pacific and the Southern Pacific, lessee, to abandon 20.587 miles of line near Grass Lake in Siskiyou County, Cal., traffic of which has been transferred to the new Black Butte Cut-Off and the Cascade line.

Dividends Declared

Pullman, Inc.—Initial, \$1.00, quarterly, payable November 15 to holders of record October 24.
Pullman Company.—\$1.50, quarterly, payable November 15 to holders of record October 31.

Average Price of Stocks and Bonds

	Oct. 18	Last week	Last year
Average price of 20 representative railway stocks..	120.30	120.39	97.68
Average price of 20 representative railway bonds..	96.00	96.06	91.10

Railway Officers

Executive

W. A. Rambach, freight traffic manager of the Missouri Pacific, has been appointed assistant to the vice-president, with headquarters as before at St. Louis, Mo. This appointment is effective November 1.

C. A. Birge, vice-president and general freight and passenger agent of the Oklahoma City-Ada-Atoka, has been appointed vice-president and traffic manager, with headquarters, as before, at Oklahoma City, Okla., following the resignation of H. G. Thompson, traffic manager.

C. B. Sudborough, who has been appointed assistant vice-president in charge of traffic of the Pennsylvania, with headquarters at Philadelphia, Pa., was born on November 1, 1876, at St. Louis, Mo., and entered railway service in September, 1897, as a register clerk in the freight claim department of the Vandalia (now part of the Pennsylvania), and later served consecutively as freight rate quotation clerk, bill of lading clerk, freight solicitor and freight clerk. Mr. Sudborough served for a time as industrial traffic manager of the Acme Cement Plaster Company, and then returned to railroad service as division freight agent of the Vandalia. He was advanced to assistant general freight agent and later to general freight agent,

pointment as assistant vice-president in charge of traffic.

Gerrit Fort, vice-president in charge of traffic of the Boston & Maine, with headquarters at Boston, Mass., has resigned to become president of the Raymond & Whitcomb Company, international travel organization. He will assume his new duties on November 1. Mr. Fort was born on November 12, 1865, at Cedar Rapids, Ia., and entered railway service in 1884 as clerk to the superintendent of



Gerrit Fort

the Burlington, Cedar Rapids & Northern (now a part of the Chicago, Rock Island & Pacific) at Cedar Rapids. He left that road in 1887 to become clerk to the auditor of the Wabash at Chicago under the receivership, which position he held for over two years. Then he resigned to become chief rate clerk in the general passenger department of the New York Central & Hudson River (now New York Central) at New York. In September, 1891, Mr. Fort was advanced to chief clerk in the same department and in January, 1897, became secretary for the Central Passenger Association at Chicago. In September, 1900, he became assistant general passenger agent of the Union Pacific, which position he held until 1907, when he was appointed assistant to the vice-president of the New York Central and three years later general passenger agent of that road for Lines East of Buffalo. A few months later Mr. Fort left the service of the New York Central to return to the Union Pacific as passenger traffic manager and in December of the same year took over the traffic managership of the Oregon Short Line. In February, 1918, Mr. Fort was appointed assistant director of the division traffic in charge of passenger traffic of the United States Railroad Administration at Washington. In January, 1920, he became vice-president in charge of traffic of the Boston & Maine, which position he was holding at the time of his recent resignation.



C. B. Sudborough

and when the Vandalia became a part of the Pennsylvania, was appointed traffic manager of the Southwestern region of the Pennsylvania, with headquarters at St. Louis, Mo. In January, 1925, Mr. Sudborough was appointed assistant general traffic manager of the Pennsylvania system, at Philadelphia, and in August of the same year was appointed general traffic manager, with the same headquarters, which position he was holding at the time of his recent ap-

Operating

S. D. Canfield, general agent of the North & South, has been appointed general manager, with headquarters, as before, at Salt Creek, Wyo.

J. W. Mitchell, auditor and car accountant of the Groveton, Lufkin & Northern, with headquarters at Groveton, Tex., has also been appointed superintendent and general freight and passenger agent, succeeding **R. D. Crow**, resigned.

P. F. McManus, general superintendent of the Elgin, Joliet & Eastern, with headquarters at Joliet, Ill., has been promoted to general manager, with headquarters at the same point, and the position of general superintendent has been abolished.

W. E. M. Neal, chief dispatcher on the Southern, has been appointed superintendent of the Knoxville & Augusta and the Knoxville & Bristol divisions of the Southern, with headquarters at Knoxville, Tenn., succeeding **W. P. Hood**, deceased.

J. W. Lytton has been appointed superintendent of the Charlotte, Monroe & Columbia and the Chesterfield & Lancaster (parts of the Seaboard Air Line), with headquarters at Cheraw, S. C., succeeding **C. Lane**, who has been appointed superintendent of the Raleigh & Charleston (also a part of the Seaboard Air Line) exclusively.

W. H. Hillis, district engineer maintenance of way of the Chicago, Burlington & Quincy, with headquarters at Galesburg, Ill., has been appointed assistant superintendent of the La Crosse division, with headquarters at La Crosse, Wis., succeeding **J. L. Mulroy**, transferred to the Beardstown division, with headquarters at Centralia, Ill.

H. A. Israel, division engineer of the Illinois division of the Missouri Pacific, with headquarters at Bush, Ill., has been appointed trainmaster of the Chester and Cairo districts of the Illinois division, with headquarters at Dupou, Ill. **C. W. Exline**, trainmaster on the Illinois division, with headquarters at Bush, Ill., will have jurisdiction over the East and West and Herrin districts of the Illinois division.

W. M. Neal, assistant to the vice-president of the Canadian Pacific, with headquarters at Montreal, Que., has been promoted to general manager of the Western lines, with headquarters at Winnipeg, Man., effective November 1, succeeding **Charles Murphy**, who will retire from active duty on that date after 44 years in the service of the C. P. R. **H. J. Humphrey**, general superintendent of the Algoma district, with headquarters at North Bay, Ont., will succeed Mr. Neal as assistant to the vice-president at Montreal. **Andrew Halkett**, superintendent on the Saskatchewan district, with headquarters at Moose Jaw, Sask., has been promoted to succeed Mr. Humphrey.

Traffic

W. P. Lambert has been appointed general agent of the Toledo, Peoria & Western, with headquarters at Shreveport, La., a newly created position.

F. A. Reid, manager and dispatcher of the motor freight system of the Pennsylvania, in the Baltimore terminal territory, with headquarters at Baltimore, Md., has been appointed general freight and passenger agent of the Chicago, Springfield & St. Louis, and the Jacksonville & Havana, with headquarters at Springfield, Ill.

J. B. Large, who has been appointed general traffic manager of the Pennsylvania, with headquarters at Philadelphia, Pa., was born on August 18, 1882, at Philadelphia, and was educated at the Protestant Episcopal Academy of Philadelphia, and attended the Wharton School of Finance of the University of Pennsylvania for a year. He entered railway service with the Pennsylvania as a clerk at Germantown Junction on October 7, 1902, and the next year was transferred to the rate room in the general office at Philadelphia. From 1906 until 1916, Mr. Large held various positions in the freight department and on October 15, 1917, was appointed assistant general freight agent of the Lines



J. B. Large

East of Pittsburgh and Erie, Pa. The following month he was advanced to general freight agent, and, when the government returned the railroads to their owners in March, 1920, Mr. Large was appointed freight traffic manager of the Eastern region, with headquarters at Philadelphia. In August, 1925, he was appointed assistant general traffic manager of the Pennsylvania system, which position he was holding at the time of his recent appointment as general traffic manager.

C. T. Mackenson, Jr., who has been appointed assistant general traffic manager of the Pennsylvania, with headquarters at Philadelphia, Pa., was born on June 16, 1886, at Harrisburg, Pa., and entered railway service in 1903 in the freight department of the Cumberland Valley (part of the Pennsylvania). He

served subsequently as claim clerk, rate clerk and chief clerk. He was transferred to the New Jersey division of the Pennsylvania in 1912, and two years later was transferred to the office of the general freight agent as chief rate clerk. Mr. Mackenson became division freight agent at Altoona, Pa., in 1916, and the next year was furloughed for military service. In 1919, he resumed his active duties at Pittsburgh. He served later



C. T. Mackenson, Jr.

as division freight agent at Uniontown, Pa., and at Pittsburgh, and was appointed assistant general freight agent of the Central region in August, 1921. In July, 1924, Mr. Mackenson was advanced to general freight agent, and in August, 1925, was appointed freight traffic manager of the Eastern region, with headquarters at Philadelphia, which position he was holding at the time of his recent appointment as assistant general traffic manager.

O. G. Parsley and **D. R. Lincoln**, assistant freight traffic managers of the Missouri Pacific, with headquarters at St. Louis, Mo., have been appointed freight traffic managers, with the same headquarters, to assume the duties performed by **W. A. Rambach**, promoted, Mr. Parsley in charge of solicitations and Mr. Lincoln in charge of rate matters. **Eugene Mock**, general freight agent, with headquarters at St. Louis, and **G. H. Hamilton**, general freight agent, with headquarters at Kansas City, Mo., have been appointed assistant freight traffic managers, with headquarters at St. Louis. Mr. Hamilton will be replaced by **H. L. Traber**, general freight agent, with headquarters at Little Rock, Ark. **H. R. Wilson**, assistant general freight agent, with headquarters at St. Louis, has been promoted to succeed Mr. Traber at Little Rock. **J. B. Trimble**, general agent of the freight department at New York, has been appointed general eastern agent, with jurisdiction also over the Gulf Coast lines and the International-Great Northern, effecting a consolidation of the freight offices of the Missouri Pacific, the Gulf Coast Lines and the International-Great Northern in New York. Mr. Trimble will succeed **C. E. Carlton**, now general eastern

agent of the Gulf Coast Lines and the International-Great Northern, who has been appointed assistant general freight agent at St. Louis. All appointments are effective November 1.

J. C. Burnett, who has been promoted to general freight agent of the Atchison, Topeka & Santa Fe, with headquarters at Topeka, Kan., first entered the service of that company in the summer of 1885 at Topeka. For the next four years while attending high school he spent his summer vacations on the Santa Fe as a clerk, starting regular service on September 1, 1889, as a stenographer in the office of the superintendent at Newton, Kan. On January 2, 1890, Mr. Burnett was transferred to the office of the general manager at Topeka, and, after several months at that point, he was again transferred to the general freight office. He also served for varying periods as a



J. C. Burnett

claim and tracer clerk, as a rate clerk, as city freight agent and as traveling freight agent at Wichita, Kan., and, on December 9, 1894, he became traveling freight agent, with headquarters at Denver, Colo., and Pueblo. In 1901 Mr. Burnett was promoted to commercial agent at Colorado Springs, Colo., and in the same year he was again promoted to general agent at Pueblo, where he remained until 1904 when he was appointed division freight agent at Newton. He served at that point and at Topeka until February 1, 1910, when he was promoted to assistant general freight agent, with headquarters in the latter city. Mr. Burnett remained as assistant general freight agent at Topeka until his promotion to general freight agent on October 1.

Engineering, Maintenance of Way and Signaling

R. A. Thompson, Jr., has been appointed chief engineer of the Wichita Falls & Southern, with headquarters at Wichita Falls, Tex.

G. S. Smith, assistant engineer on the Missouri Pacific at Coffeyville, Kan., has

been promoted to division engineer of the Illinois division, with headquarters at Bush, Ill.

J. F. McDonald, office engineer of the New York Central, Lines East of Buffalo, with headquarters at New York, has had his jurisdiction extended to cover the Lines West and the Ohio Central Lines.

R. L. Sims, engineer maintenance of way, of the Chicago, Burlington & Quincy, with headquarters at Lincoln, Neb., has been transferred to Alliance, Neb., succeeding **A. Chinn**, who has been transferred to Lincoln and placed in charge of work equipment.

Purchases and Stores

J. K. McCann, storekeeper on the Chicago, Burlington & Quincy, with headquarters at St. Joseph, Mo., has been appointed general piece work inspector, with headquarters at Chicago. **R. H. Johnson** has been appointed storekeeper at Alliance, Neb., succeeding **J. W. Schwartz**, who has been transferred to St. Joseph to succeed Mr. McCann.

Arthur M. Gage, who has been promoted to general storekeeper of the Michigan Central, with headquarters at Detroit, Mich., was born on September 10, 1883, at Berea, Ohio. He entered railway service on July 17, 1902, with the Lake Shore & Michigan Southern (now a part of the New York Central). From June 1, 1909, to September 1, 1909, he was a storekeeper on the Lake Erie, Alliance & Wheeling, now a part of the New York Central, and from September 1, 1909, to March 1, 1910, he was a storekeeper on the Lake Shore & Michigan Southern at Englewood, Ill. On the latter date he was promoted to assistant storekeeper, with headquarters at Elkhart, Ind., which position he held until July 1, 1912, when he was appointed storekeeper on the Lake Erie & Western, with headquarters at Lima, Ohio. On August 7, 1920, he was promoted to assistant general storekeeper of the Michigan Central, with headquarters at Detroit, Mich., which position he has held until his recent promotion.

Obituary

E. O. Grundy, who retired as general freight agent of the Quebec Central in 1918, died on October 17, at Sherbrooke, Que.

John DeWitt, supervisor of mail and express traffic of the Atlantic Coast Line, with headquarters at Wilmington, N. C., died at Wilmington on October 8.

T. J. Irving, division engineer of the Minnesota division of the Chicago & North Western, with headquarters at Winona, Minn., died from heart trouble in a hospital at Rochester, Minn., on September 22. Mr. Irving had been granted leave of absence from his duties as division engineer in August.

Thomas A. Graham, former assistant freight traffic manager of the Southern Pacific, and more recently connected with several steamship lines, died of influenza at Sydney, Australia, on September 26. Mr. Graham was born on September 11, 1864, at San Francisco, Cal., and entered railway service when 14 years of age as office boy and clerk on the North Pacific Coast (now a part of the Southern Pacific). In December, 1881, he became a clerk in the general passenger office of the S. P. at San Francisco, later being promoted to chief rate clerk, where he remained until December, 1889, when he was again promoted to district passenger and freight agent at Tacoma, Wash., and Seattle. From 1899 to 1901, he acted as district freight and passenger agent at San Jose, Cal., and was next advanced to assistant general freight agent at San Francisco. In October, 1905, he was appointed assistant general freight and passenger agent, with headquarters at Los Angeles, Cal., remaining at this post until his promotion to general freight agent, with headquarters at San Francisco, in March, 1911. Mr. Graham served only a few months as general freight agent until he was promoted to assistant freight traffic manager, with headquarters at San Francisco. In September, 1921, he was appointed general manager of the Pacific Mail Steamship Company and later was connected for a time with the Dollar Steamship Line.



Flomaton, Ala., on the L. & N.